War and Men of Science

Ilse Bry and Janet Doe

The Russell-Einstein plea for the abolition of war (*1*) calls to mind earlier efforts of scientists to make science serve the welfare of mankind, one of which was an appeal signed by Einstein before World War I. In the spring of 1912 a group of scholars distinguished in philosophy and science invited all philosophically minded scientists to join a Gesellschaft für positivistische Philosophie, with the aim of arriving at a unified scientific, rigorously empirical conception of the world. Einstein, at the age of 33, was by far the youngest of the 33 signers, who included such deans and pioneers in their respective fields as Sigmund Freud, Ernst Mach, Felix Klein, David Hilbert, August Forel, Jacques Loeb, Josef Popper, Hugo Ribbert, Wilhelm Roux, and F. C. S. Schiller. The oldest, the philosopher Wilhelm Schuppe, was then 76 years old, as was Einstein when he signed his last appeal. By number as well as by eminence of their members, the following branches of science were about equally well represented: philosophy and psychology; physics and technology; medicine and psychiatry; biology and physiology; mathematics and astronomy; and sociology, including history and law (*2*).

Leading philosophical and scientific journals on the Continent and in this country carried the appeal (*3–7*), its accompanying statement (*8–9*), or a résumé with comments (*10–13*). Although it was "scientific news" of the years 1912–13, the document seems to have been buried ever since. The explanatory statement strikingly conveys to us today the spirit that then prevailed: first, the firm belief that a total mastery of scientific fact must be tantamount to the self-mastery of man; second, an awed feeling that the special sciences were approaching their own limits; and third—astounding for an era already apprehensive of a threatening war—an Olympian indifference to the nether realms of politics, power, and peace (*8*).

"There has long been felt the need of a philosophy which should grow in a natural manner out of the facts and problems of natural science. The mechanical view of nature no longer satisfies this need. Let any one recall the 'Ignorabimus' of Du Bois Reymond and the various attempts to relate mechanical and psychological processes by means of neovitalistic concepts, attempts of physicists as well as of biologists. The current philosophy, of Kantian origin for the most part, or with strongly Kantian emphasis, is impotent here, because it directs its inquiries without any deep appreciation of the need in question, because it treats of problems scarcely intelligible to anyone who comes to them from the natural science of to-day, and because it is usually not able to go far enough into the questions of natural science.

"To be sure, there has grown up from the soil of natural science itself a strictly empirical and positivistic point of view quite indifferent to metaphysical speculation and to so-called critical, transcendental doctrines. Its principles are however not yet accepted in their essential meanings and systematic relations throughout considerable scientific circles. They are even completely misunderstood by distinguished scientists as they are by most of the influential philosophers.

"On the other hand the particular sciences find themselves forced to consider problems of even greater generality so that they take on of themselves a philosophical character. Mathematics advances to higher and higher abstractions. Geometry, in its deductive development, is freeing itself from all intuition after overcoming the limits of the Euclidean conception of space. In the theory of groups it has reached a positive treatment of the concept of infinity, once a purely negative idea, and it faces now the question of its differentiation from logic. Physics has been made to include more and more remote fields of research. Optics and all the phenomena of radiation have been brought under the concepts of electromagnetic theory, and physics has now before it the question, how far can mechanics be interpreted in terms of electromagnetism? In the theory of relativity it touches the most searching question thus far of epistemology: Is absolute or is only relative knowledge attainable? Indeed: Is absolute knowledge conceivable? It comes here directly upon the question of man's place in the world, the question of the connection of thought with the brain. What is thought? What are concepts? What are laws? In psychological problems, physics and biology come together. And finally, the anthropological sciences, especially history and sociology, find themselves brought into closer and closer connection with biological concepts.

"Those who take an interest in these progressive inquiries will find it to their advantage to have a scientific association which shall declare itself opposed to all metaphysical undertakings, and have for its first principle the strictest and most comprehensive ascertainment of facts in all fields of research and in the development of organization and technique. All theories and requirements are to rest exclusively on this ground of facts and find here their ultimate criterion.

"Annual reports will bring together all branches of the association, the bibliographies will be collected of the material that can be made to contribute to strictly positivistic theory, and as soon as possible a periodical, for which the resources are already assured, will serve the undertaking.

"We ask for members and active cooperation. If all those who are competent and earnest in genuinely scientific philosophical work, or who take an interest in the progress and results of such research, will write in this way we cannot fail to meet with success, which will lead us in no distant future out of the unsatisfactory conditions of the present. The present day is surfeited with the fruitless and nearly uniform repetition of philosophical ideas, often expressed before, but not sufficiently clear and concrete, and, on the other hand, with the increasing separation of science into ever smaller divisions and with the merely external accumulation of results. The present day desires the solution of general problems, which research itself throws up, and is not to be put off with an *Ignorabimus* for which there is no evidence."

The Gesellschaft für positivistische Philosophie, with its headquarters in Berlin, was indeed founded and held its opening session in November 1912. By June 1913 the society had 170 members (*14*). From a French report, we gather that the membership list then included Bektherev (St. Petersburg) and Enriques (Bologna). An ominous note was sounded in the expressed regret that no French name appeared on the list, al-

Dr. Bry is in charge of the Neuropsychiatric Library of New York University–Bellevue Medical Center, New York. Miss Doe is librarian of the New York Academy of Medicine, New York, N.Y. This review of the interest of scientists in the prevention of war shows the late Albert Einstein's great leadership for nearly half a century in shaping our thinking about the implications and consequences of scientific developments and events as well as his leadership in scientific progress itself.

though science had received its classic form through the French scientists of the 17th and 18th centuries, and in the suggestion to form an analogous society in France under the name Amis de la Science (*13*).

The organ of the German society began in 1913 as *Zeitschrift für positivistische Philosophie* but ceased the next year with volume 2, numbers 3 and 4 (*14*). The last issue includes a paper by one of the founders of the society, Joseph Petzoldt, on the biological foundations of psychology (*15*); it had been prepared for the Fourth International Congress for Neurology, Psychiatry, and Psychology, which was to be held in Bern in September 1914 but convened instead in Paris in 1923.

Although the war put an end to this first collective effort, the same spirit was revived by a younger generation of scientists in the 1920's, particularly in the Vienna Circle around Moritz Schlick. In Berlin the prewar philosophical society was followed, in 1928, by the Gesellschaft für empirische—later "wissenschaftliche"—Philosophie, whose members were, among others, Hans Reichenbach, Kurt Lewin, and Wolfgang Köhler. Its object was to promote "a philosophical method which advances by analysis and criticism of the results of the special sciences to the stating of philosophical questions and their solutions." The journal sponsored by this group from 1930 on was significantly named *Erkenntnis,* since it was felt that the goal of cognition was set for philosophy in the same sense as for each special science (*16–18*).

Nicolai-Einstein-Förster Manifesto

With inconspicuous beginnings World War I had set in motion a new development destined to overtake the tradition "that it was undesirable that scientists should mix themselves up in the hurly-burly of the world" (*19*). The pacifist stand taken by Einstein over the years is amply recorded (*21–23*), and it is well known that, in October 1914, he did not sign the manifesto of the 93 German intellectuals protesting their fatherland's innocence of war guilt and identifying German militarism with German civilization. The countermanifesto, drafted later that same month by Georg Friedrich Nicolai, Albert Einstein, and Wilhelm Förster, has received less attention, although historical perspective has made it more important. Nicolai gives a full account of both documents in the "Introduction" to his *Biology of War* (*19*). He also records the excuse—"if it be an excuse"—that some of the signers had never read the notorious manifesto but had authorized their signatures on the strength of a telegram from the influential politician Erzberger. His words sound prophetic:

"The fact remains, however, that this manifesto was published and distributed broadcast; and considering how the war seemed to have metamorphosed men of science, it seemed desirable, not to say necessary, to appeal to a wider public especially to maintain a uniform conception of civilization, just then divided. For although only the few are capable of promoting civilization, yet it is by the standard of popular feeling that the maintenance of its continuity is insured."

The appeal of the three famous pacifist scientists stated in part:

"Technical science and intercommunication are clearly tending to force us to recognize the fact that international relations exist, and consequently that a world-embracing civilization exists. Yet never has any previous war caused so complete an interruption of that cooperation which should exist between civilized nations.

". . . Those who care in the slightest degree for this universal world civilization are under a twofold obligation to strive for the maintenance of these principles. Those who might have been expected to care for such things, in particular men of science and art, have hitherto almost invariably confined their utterances to a hint that the present suspension of direct relations coincided with the cessation of any desire for their continuance.

"Such feelings are not to be excused by any national passions. They are unworthy of what everyone has hitherto understood by civilization. . . . Hence it must be the duty of educated and philanthropic Europeans to make, at any rate, an effort lest Europe . . . should suffer the same tragic fate as ancient Greece. Is Europe gradually to be exhausted by fratricidal war and perish?

"The war raging at present will scarcely end in a victory for any one, but probably only in defeat. . . .

"It seems to us before all else necessary that there should be a union of all in any way attached to European civilization. . . . We must never abandon hope that their collective pronouncement may be heard by someone even amidst the clash of arms, most especially if the 'good Europeans' of to-morrow include all those who are esteemed and considered as authorities by their fellow-men.

"To begin with, however, it is needful that Europeans should unite. . . . We ourselves wish only to give the first impulse to such a union; wherefore we ask you, should you be in agreement with us, and, like us, bent upon making the determination of Europe as widely known as possible, to send us your signature."

To this manifesto, which was privately distributed, many sympathetic letters were received, yet most of the writers declined to sign it. Denied the necessary backing by well-known names, the plan was dropped (*19–21*).

Changing Attitude toward Scientific Progress

Almost two decades later the growing concern with the position of the scientist in the vital, nonscientific matter of war and peace found another dramatic expression in the Einstein-Freud correspondence *Why War?* (*23*), which resulted from a proposal of the League of Nations International Institute of Intellectual Cooperation that Einstein choose an important topic and an eminent scholar with whom to discuss it publicly. Einstein selected "the most insistent of all the problems civilisation has to face":

"Is there any way of delivering mankind from the menace of war? It is common knowledge that, with the advance of modern science, this issue has come to mean a matter of life and death for civilisation as we know it; nevertheless, for all the zeal displayed, every attempt at its solution has ended in a lamentable breakdown."

The exchange of letters took place in 1932, a year before science was once more affected by the political events in Germany.

Outside of Germany the movement toward unity of science, based on positivism and logical empiricism, gathered new strength. International Congresses for the Unity of Science were held, from 1935 on, in Paris, in Copenhagen, in Paris again, in Cambridge, England, and at Harvard. The sixth and last of the congresses convened at the University of Chicago in 1941. The *International Encyclopedia of Unified Science,* planned in 1935, began publication in 1938. Yet, as before, these endeavors of the scientists were disturbed and discontinued by the advent of war. The periodical *Erkenntnis,* in 1939 renamed *Journal of Unified Science* and published in The Hague, ceased in April 1940 (*17, 18, 24*).

After World War II we find the scientists rallying again to the banner of unification of scientific knowledge, concepts, and total outlook. A new German journal appeared in 1947, *Studium Generale,* devoted to the unity of the sciences in the context of their conceptualizations and research methods; only this time the synthesis of science was sought in explicit juxtaposition to philosophy (*25*). In this country work on the *International Encyclopedia of Unified Science* was resumed; in 1949 a grant from the Rockefeller Foundation made possible the incorporation of the *Institute for the Unity of Science,* which has since been in charge of the project (*18*).

However, there was one difference: scientific progress was no longer being unquestionably identified with the road to human perfection—this equation had become a casualty at Hiroshima. At about the time of the first appeal, in August 1912, *Science* printed a lecture by Victor C. Vaughan on "The philosophy of a scientist" which proclaimed (*26*):

"No philosophy evolved from the inner consciousness of man has ever done man half the good that has been secured to him by the discovery of the agents of infection. In fact no important discovery in science has failed to better the lot of man. . . .

"The scientist, even though he be a rank materialist without any belief in the supernatural . . . has his dreams of the future. He dreams of the time when the engines of destruction will be so powerful and certain in action that war will be impossible, and the world shall become one great community of enlightened, intelligent human beings, dwelling in peace and unity."

By the middle of the century, scientists believed that engines of destruction had become powerful enough and sufficiently certain in action to annihilate life on earth; but they were not so sure that this meant fulfillment of the rest of the dream. They were also aware of the profound change that had taken place in their own reaction. To illustrate this change, Richard von Mises quoted the closing words from Mach's *Erkenntnis und Irrtum* (1905) (*27*):

"If we consider the tortures which our ancestors had to suffer from the brutality of their social institutions, their conditions of law and justice, their superstitions, and their fanaticism, if we realize the abundant present inheritance of these goods, and if we imagine how much of this we shall still experience in our descendants, this is a sufficiently powerful incentive for us to cooperate vigorously and vehemently in the realization of the ideal of a moral world order by means of our psychological and sociological knowledge. But once we have created such a moral order, nobody will be able to say any longer that it is not of this world, and nobody will have to look for it any longer in mystical heights or depths."

Von Mises, himself a positivist, writing in 1951, had this comment: "Who can believe that these words would have been written if Mach had lived through the last few decades?"

Social Responsibility in Science

The new mood of the scientific world found its first positive expression in the formation of the Society for Social Responsibility in Science, with the aim (*28*):

" . . . to foster throughout the world a . . . tradition of personal moral responsibility for the consequences for humanity of professional activity, with emphasis on constructive alternatives to militarism; to embody in this tradition the principle that the individual must abstain from destructive work and devote himself to constructive work, according to his own moral judgment; to ascertain . . . the boundary between constructive and destructive work, to serve as a guide for individual and group decisions and action. . . ."

Once more it was Einstein who served as spokesman for the scientific *avant-garde*. *Science* published his letter written upon joining the society in the summer of 1950; the last paragraph states (*29*):

"In our times scientists and engineers carry particular moral responsibility, because the development of military means of mass destruction is within their sphere of activity. I feel, therefore, that the formation of the Society for Social Responsibility in Science satisfies a true need. This society, through discussion of the inherent problems, will make it easier for the individual to clarify his mind and arrive at a clear position as to his own stand; moreover, mutual help is essential for those who face difficulties because they follow their conscience."

During the 5 years that have elapsed since, military means of mass destruction have come to denote "weapons [that] threaten the continued existence of mankind" and to imply "the risk of universal death." On this most recent occasion, when Einstein, in the last week of his life, gave his last signature to an appeal, the scientists signing it were speaking no longer as men of science, "not as members of this or that nation, continent or creed, but as human beings, members of the species man, whose continued existence is in doubt" (*1*).

Within a week a similar statement, signed in mid-July by another group of Nobel prize-winning natural scientists, reaffirmed their devotion to the service of science as "a road to a happier life for mankind." Yet, these scientists continue, "we view with horror that this science provides the means to mankind to destroy itself" (*30*). The second warning to all nations that they will cease to exist unless they are ready "to renounce force as a final resort to policy" was to be sent to all other Nobel prize winners for signature—thus echoing the fervent hope three men of vision expressed 40 years ago that such a "collective pronouncement . . . include all those who are esteemed and considered as authorities by their fellow-men" (*19*).

In the four decades here surveyed science has mastered ever more facts, has come still closer to reaching its own limits. But in the process scientists have attained a humility, simplicity, and political consciousness, lacking in most of their elders, which may be needed to prevent history from repeating itself for the very last time.

References and Notes

1. *New York Times,* 10 July 1955, p. 25.
2. The other signers were Max Hermann Baege, Eugene Dietzgen, August Föppl, Georg Ferdinand Helm, Christian Jensen, Wilhelm Jerusalem, Otto Kammerer, Berthold von Kern, Karl Lamprecht, Eduard von Liszt, Georg Elias Müller, Franz Müller-Lyer, Joseph Petzoldt, Henry Potonié, Ludwig Rhumbler, Hugo von Seeliger, Ferdinand Tönnies, Max Verworn, F. Alexander Wernicke, Otto Wiener, and Theodor Ziehen.
3. *Naturw. Rundschau* **27**, 336 (1912).
4. *Arch. Gesch. Phil.* **25**, 502 (1912).
5. *Z. Psychol.* **62**, 159 (1912).
6. *Arch. für Psychiat. Nervenkr.* 50, 321 (1912).
7. *Riv. Filosofia* **4**, 547 (1912).
8. *J. Phil. Psychol. Sci. Meth.* **9**, 419 (1912).
9. *Phil. Jb. der Görres Ges.* **26**, 419 (1913).
10. *Rev. Sci. Phil. Théologiques* **6**, 621 (1912).
11. *Riv. Filosofia Néo-Scolastica* **4**, 704 (1912).
12. *Rev. Néo-Scolastique de Phil.* (*Louvain*) **19**, 580 (1912).
13. *Rev. Phil. de la France et de l'Étranger* 76, 558 (1913).
14. *Z. positivistische Phil.,* Organ der Gesellschaft für positivistische Philosophie, Berlin. 1–2 Jahrgang, 1913–14; Mitt. an die Mitglieder der G.f.p.Ph., at end of each issue.
15. J. Petzoldt, *Z. positivistische Phil.* **2**, 161 (1914).
16. Gesellschaft für empirische Philosophie, Berlin, *Erkenntnis* 1, 72 (1930–31); O. Neurath, *ibid.* 1, 311 (1930–31).
17. *Erkenntnis* 1–8 (1930–40). Title varies: 1930–38; *Erkenntnis* 1–7, *zugleich Ann. Phil.* 9–15 (slight variations); June 1939–April 1940 (8), *J. Unif. Sci.* (*Erkenntnis*). "Im Auftrage der Gesellschaft für wissenschaftliche (1930, empirische) Philosophie Berlin und des Vereins Ernst Mach in Wien," 1930–33. Leipzig. June 1939–April 1940, published in The Hague; H. Reichenbach, *ibid.* 1, 3 (1930–31).
18. J. Jørgensen, *The Development of Logical Empiricism* (Univ. of Chicago Press, Chicago, Ill., 1951).
19. G. F. Nicolai, *The Biology of War* (Century, New York, 1918), pp. xi–xx.
20. ———, *Aufruf an die Europäer; Gesammelte Aufsätze zum Wiederaufbau Europas* (Verlag der Wiener Graphischen Werkstätte, Leipzig, 1921), pp. 21–25.
21. A. Einstein, *The Fight against War* (John Day, New York, 1933).
22. ———, *The World as I See It* (Covici, Friede, New York, 1934); *Out of My Later Years* (Philosophical Library, New York, 1950); *Ideas and Opinions* (Crown, New York, 1954); P. Frank, *Einstein, His Life and Times* (Knopf, New York, 1953); Bibliography, II. Non-Scientific Writings; III. Interviews, Letters and Speeches Quoted in *New York Times,* in P. A. Schilpp, *Albert Einstein, Philosopher-Scientist* (Library of Living Philosophers, Evanston, Ill., 1949), pp. 730–756.
23. A. Einstein and S. Freud, *Why War?* (International Institute of Intellectual Co-operation, Paris, 1933), pp. 11–12. Published simultaneously in German, French, and English.
24. O. Neurath *et al.,* "Internationale Enzyklopaedie der Einheitswissenschaften," *Erkenntnis* **6**, 139 (1936); 3rd Intern. Cong. Unity of Science, Paris, 1937, *Zur Enzyklopädie der Einheitswissenschaft: Vorträge von Neurath, Brunswik, Hull, Mannoury, Woodger* (Van Stockum & Zoon, 's Gravenhage, 1938); H. Feigl, "Selected bibliography of logical empiricism," *Rev. Intern. Phil.* 4, 95 (1950).
25. *Studium Generale*; Zeitschrift für die Einheit der Wissenschaften im Zusammenhang ihrer Begriffsbildungen und Forschungsmethoden. Heidelberg und Berlin. 1 Jahrgang, Heft 1, October 1947–; M. Thiel, *ibid.* **1**, 1 (1947).
26. V. C. Vaughan, *Science* **36**, 225 (1912).
27. R. v. Mises, *Positivism: a Study in Human Understanding* (Harvard Univ. Press, Cambridge, Mass., 1951), p. 366.
28. "A society for social responsibility in science," *Science* **110**, 460 (1949).
29. A. Einstein, *Science* **112**, 760 (1950).
30. *New York Times,* 16 July 1955, p. 3; *Christian Science Monitor,* 16 July 1955, p. 2.