AS A FOOL RUSHES IN

by Earl Ubell

When Howard Radest asked me to give the keynote address for this forum, my affection for the ethical movement seduced me into accepting the assignment. My usual good common sense flew out through my ears. Marc Chagall could have painted the surrealism of the event in bright colors.

And when I received a letter from Sherwin Wine giving me my speaking orders, my autonomic nervous system collapsed, suffusing me with cold sweat, a rapid heart and a certain dizziness. Rabbi Wine asked me to give forth for 60 minutes on how "the revolutionary developments in science affect the world view of historic Humanism. In what way are old beliefs confirmed? In what way are new beliefs necessary?" Rabbi Wine, that is a multi-volume boxed set of books. And, indeed, if I were to answer the questions, the forum could end this evening.

And to intensify my stage-fright, Sherwin gave me the good news that my remarks were to be published in *Humanism Today*. So my remarks need the construction of a literary work with the polish of speech.

What am I doing here? I am merely a journalist with the astounding good fortune to have witnessed some of the revolutionary developments in science in the last forty years or so. I am no philosopher, historian of science, nor a working scientist. My knowledge of Humanism I gathered mainly at Howard Radest's knee, when he was Leader of the Bergen Ethical Society and lone of his flock.

I am truly unable to apply the finely tuned reasoning of philosophy. But perhaps I can give you some grist for your discussional mills. Maybe I can take the long way round and deal with Rabbi Wine's *kashes* indirectly and open some more questions about the interaction of science and its works on the one hand, with human reach and needs on the other. I take as an axiom that the human being and his (and, of course, her) potential stand at the center of our concern. I want to see our species create a world in which each human being can achieve to the limit of his or her biological endowment. I leave the angels to their heaven.

Contrary to the naysayers of gloom and doom, I must report that never has the human condition, biologically and spiritually, been better. I do not have to reach back very far in history to encounter human beings with but dim prospects for living beyond the age of 20. It has but recently occurred to me that AIDS reigned as the major killer in those centuries. Yes, it was acquired immune deficiency disease, but of a cause different from the horror now spreading everywhere.

In the 13th Century, the average person in Western Europe consumed 800 calories on good days. Their protein deficiency damaged their immune systems profoundly and marked them as targets for any infection, however mild. Measles in those days killed readily. Immune deficiency brought on by semi-starvation. And, as Thomas McKewen has written, the major turn about in mortality in Europe came in the 17th Century with an increase of food intake to about 1,200 calories.

From the beginning of this century to now, we have had a steady increase in life expectancy, not only in Western society, but around the world. To be sure, we can still waggle our fingers at much misery. In our own country, blacks lag in their chances at living longer. The maternal mortality rate for blacks is three times that of whites. But a black baby born today has a better chance at long life than a white baby born in 1900. So the arrow of hope points upward there.

Even in parts of the world where life clings precariously to bones, we have strong improvements in living conditions, so much so that we suffer the side effects of a population explosion with 6 billion human bodies crowding the planet. Interestingly enough, the food supply seems to have kept up with the geometrically increasing human protoplasm, Malthus to the contrary not-withstanding. India, as a case in point, has not had a famine in years thanks to revolution in agriculture employing scientifically developed new strains of rice and other food plants.

Some will dub me a Pollyanna for seeming to say that all's right with the world. I am merely leading up to the idea that the world is improving, not getting worse. Even so there will be plenty of problems to work on for the next few centuries, so I am not concerned that Humanism will run out of steam .

Now what about our spirit, our life of the mind and of feeling. Better or worse? Here my thesis cracks a little, not because there exists patent disproof, but because we have little real data one way or the other. It is easy to point to the terrors in this century of World Wars I and II, of Korea, of Vietnam, of South Africa, and on and on. Everywhere, we see confrontation and what appears to breakdown of human concern for human being. In short, a spiritual poverty.

I spent the summer cycling through the Loire Valley of France, which, as you know, is dotted with the most estimable castles in the world. When I toured about eight or nine of the chateaux (eventually, they all fused into one giant castle whose walls were covered with the same faded, blue-green tapestry), I realized that in those days of pervasive religious dominance that on a daily basis people brutalized each other with a ferocity unmatched even in our most despicable ghettos of today. One could not wander far from one's garden without encountering life-threatening danger. Each level of society exploited the one below with a crunching, unremitting pressure. And even at the highest levels, kings and princes turned their backs on each other

only in moments of foolishness. Infanticide was the rule, as were regicide, fratricide, patricide and matricide, all much worse than herbicide and insecticide.

In the Western world, we no longer tolerate such behavior on a daily basis. You can walk the streets of most cities (even New York) in peace and safety. People are modestly polite to one another and even help each other in dangerous situations. Large numbers of people work together in offices and factories in harmony, ranging from adequate to wonderful. We are getting along better. I wish I could prove it. And I realize that contrary examples abound.

Much of our biological and social improvement stems from improvements in the quality of our environment (there I go again, Mr. Optimist). By and large we live in homes far more spacious and better equipped than existed in the past for any but the most wealthy and well-placed persons. Indoor plumbing, central heating, refrigeration, air conditioning, and cooking stoves cannot be put down as modern day affectations. They contribute directly to longevity by preventing many of the afflictions that did our forebears in. A glance at newspapers of the turn of the century reveals pages of advertisements for patent medicines to relieve mostly digestive tract disorders that sound a good deal like food poisoning brought on by lack of refrigeration.

I would also remind you that even today the death rate from accidents in rural areas far outruns accidental death in cities. With its badly designed machinery, agricultural areas provide much opportunity for chewing up arms, legs and bodies. In former times, in Western society, 80 percent of the population lived in the countryside. Our industrial technology has made our cities the healthier and preferred places to live.

We have had our ups and downs. The industrial revolution was paid for with the bodies of its workers. We have come a long way from that. We polluted our air and water supplies by using them as industrial waste disposals. We are now unpolluting them rapidly. New York's air, like New York's water, rivals the purity of that of any city. We are now engaged in releasing thousands of strange chemicals into the environment. We do not know what their impact will be, but we have made a start on some sort of control. In medicine, we produced thousands of quack medicines. We are replacing them with powerful substances that really work.

I am not exactly drawing a utopia, but rather a picture of a species determined to make things better. And mostly we are making things better through technology and its handmaiden, science.

As I look back at 40 years of journalism that reported the technology and science that brought all this about, I am dumbfounded and hopeful; dumbc founded by the astonishing nature of the discoveries and developments and the rapidity with which they reached the hands of ordinary people, and hopeful that their beneficence will come to rest on most of the world.

To name but a few: antibiotics, mood~changing drugs, transistors, stored program computers, lasers, vaccines, plastics, high tech materials, jet flight, trans-sonic flight, DNA and genetic engineering, hybridomas, scientific nutrition, plant genetics, herbicides, insecticides, and of course, television, all in the forty years of my journalistic life.

Now strangely, as we have seen the world become more scientific and technological, we have experienced a concomitant rise in superstition. Newspapers today carry more astrology and numerology columns than ever; people flock to strange nutritional theories, buying totally absurd diet books by the millions; they turn their backs on established medicine and seek alternative medicine which has nothing to recommend it except a new vocabulary; they avidly believe in flying saucers as visitors from outer space with no proof at all; scientific creationism has been coined as a double word with no meaning and with the intent to put primitive creation superstition on the s~me footing as scientifically supported evolutionary theory; and even the most educated will fall easily for psychological theories of human action that have little to support them except extremely articulate purveyors; and the final superstition, held by the most educated of all, that there are areas of human activity that cannot, per se, be studied scientifically.

How did this all come about? First it was predicted by Dorothy Thompson, a very astute newspaper columnist of the 1930's 1940's, who suggested that as our fundamental knowledge became more scientific that our population would turn more to superstition, except it would be a new kind of superstition turning on the very science that feeds it.

In part, I believe, that most people in our society do not understand the fundamental nature of science, never having practiced the profession and treated only to a pale rendition in high school and college. In four years of high school science, including biology, chemistry and physics, and in four years as an A physics student (in an excellent college, CCNY), I never solved a problem nor performed an experiment whose answer was not in the back of the book. I did make a true scientific discovery ten years after I became a journalist.

And if you ask, what is science? You will get a puzzled expression in response. Many deep thinkers have tried to define science. I won't repeat all their often clever definitions, one being that science is clever people thinking hard about hard problems. Rather I would like to share with you a somewhat different approach that will cast some light on Sherwin Wine's request for the need for new beliefs.

Rather than define science, I am going to list some activities associated with science. They are roughly in order of importance. First is quantification . expressing descriptions in numbers. Let me quote Lord Kelvin on this subject:

> When you can measure what you are speaking about, and express it in numbers, you -know something about it; but when you cannot measure it, when you cannot express it in numbers, your knowledge is of a meager and unsatisfactory kind: it may be the beginning of knowledge, but you have scarcely, in your thoughts, advanced to the stage of science.

Second ingredient: I don't know if there is a nice Anglo-Saxon word for it, but I'll call it "objectification," which I take to mean that the observer takes himself out of the experiment. In *Portrait of the Artist as a Young Man,* James Joyce provided an objectified goal for the artist.

> The personality of the artist, at first a cry or a cadence or a mood and then a fluid and lambent narrative, finally refines itself out of existence, impersonalizes itself, so to speak. ... The artist, like the God of the creation, remains within or behind or beyond or above his handiwork, invisible, refined out of existence, indifferent, paring his fingernails.

This is an extraordinary insight into the role of the objective observer, meant here for literature, but it applies especially well to science. In science, taking the observer out means taking the human bias out; the biases that arise from our cultural condition, our need to be right, our understandable human tendency to fit facts to the thought.

Third: repeatability -- a discovery really has little value if it cannot be repeated by another observer. Unfortunately, many events in nature do not hold still for a second opinion -- you can never step into the same river twice. But about once a week, I am offered a cure for cancer which has not been so verified.

Fourth, logical connectivity, a fancy way of saying that one can draw conclusions from the data that follow some formal logical scheme, usually Aristotelean. If some one cannot tell me why A is connected to B, I am unhappy with the quality of the data he is presenting. Of course, you can also connect a lot of empty garbage logically, so this condition is not a sufficient one for science, but a necessary one.

Fifth, experimentalism and observability. In science, one usually sets up experiments or observations (as of the stars or of society). Although a great deal has been achieved with experiments carried out in the mind (Gedanken experiments: Einstein loved them), at some point somebody has to go into a laboratory and rub two sticks together or peer through the end of a telescope or gather data about the height and girth of young men from Samoa. Aristotle has a great many things in his works that he could have easily disproved if he had gotten his hands dirty.

Next, instruments -- machines. We have made enormous progress in science, the understanding of nature and ourselves, because we have invented instruments to measure things. And the more accurate those devices,

the more strong our science becomes, the more we can rely on the data as being close to what exists in reality, whatever that is.

And, finally, the sharing of data. Scientists have always shared the data with their colleagues, eventually: that is, after they have received credit for the discovery. If someone refuses, on principle, to share data, beware.

Now for Ubell's Law of Science: the more of these ingredients a work of science contains, the more I would be willing to bet that the outcome represents rather strongly an important feature of reality. I call such science, strong science. Weak science contains fewer of these important ingredients or each to a lesser degree.

The degree to which a so-called scientific claim falls outside our common pool of knowledge determines the strength of the scientific data needed. The more outrageous the claim, the more quantification, objectivity, repeatability, etc, are needed to support the new and unusual supposition.

For example, Joe said to you: "I'll bet you $1,000 I can jump over this roof." Would you take the bet? Certainly, because your experience and knowledge of the human body tells you that for a human to jump unaided more than 15 feet is impossible. Now if after you have shaken hands on the bet, Joe says: "Pay me, because I have really done it." In no way would you pay up except to observe and somehow to record the feat. Neither would you accept somebody else's word that Joe had jumped over the roof. The reason is simple. You would demand strong science because such a jump would be far outside of our common pool of knowledge and experience.

When it was suggested that quantum theory revealed that you could not measure simultaneously to ultimate accuracy the velocity and position of an atomic particle, very strong proof was needed both through actual quantitative measurements and through logical connection.

All the more reason that I am often confused by finding that people will accept unsupported statements without any demand for proof of any kind except the words of the ,claimant or some satisfied witness giving testimony as in a revival tent.

Walk into any health food store and you will find outrageous concoctions noted to be good for this or that ailment. ("My mother says zinc is good for the common cold.") Such claims are presented without a scintilla of proof or with reference to some publication, which upon checking turns out to be a popular magazine quoting an obscure so-called scientific finding. All of which leads me to say that there is little health in a health food store.

On the other hand, about a year ago the National Heart Institute reported a clear demonstration that a reduction in blood cholesterol levels by the use of a drug called cholestyramine led to a lowered risk of heart attack and

death. About 6,000 men volunteered to take the nasty tasting stuff for 7 years: only not every man received cholestyramine. Half got the drug: half a phoney pill, a placebo. Scientists followed the men for seven years counting episodes of heart attack.

The next time somebody comes to you with some sort of nostrum good for your health, check it against the cholestyramine study to see if their data can be as reliable as that study, which cost between $10 and $15 million to perform. Strong science does not come cheap.

All of this makes me suspicious when someone, usually a psychologist, says, that it is impossible to make the same measurements on a human being as on a rat: or that one need not impose the rubric of physics on the study of human thought and feeling. Wrong on both counts. Any measurement you can make on a living rat can be made on a human being. And second, the denigration of the physical sciences as models for the social sciences betrays an ignorance of what science --not physics, not chemistry, not biology -- is all about. Science is obout quantification, objectivity, repeatablity -- and all the rest. Hard to do in human circumstances? Certainly. Cheap? Never. Rewarding? Always.

Like the folk of the middle ages, we seem to look for and to authority, only, now instead of priests, our articulate con men hold sway by merely making the most outrageous claims. Sometimes they spin marvelous tales that have the odor of science about them, but none of the important ingredients.

Looking at various claims in the way I have suggested, one comes to some awful conclusions or questions. Why should anybody believe Freud's concepts? On almost every count, his material would be dubbed weak science -- non-quantitative, not repeatable, no experiments, etc. The Freud's successors solved the problem easily by dismissing the characteristics of science as not applicable to the human mind, although Freud used the then current fashionable theories of energy and conservation of energy as a framework for his dynamics. Freud himself dreamed of a physiology of the mind that would replace his psychic constructs. And indeed, modern neurobiology may fulfill Freud's dream within the generation.

To read a modern text on Freudian psychology is like reading a Renaissance essay. No references, no data, just excouch statements that encompass everybody as if we all had the same psychic constructs in our heads. I will spare you a close analysis (in the scientific sense) of the lack of underpinning for Freudian theory. -Yet this theory (and its many offspring) has enthralled (thrall meaning chained) two generations of our literati. They succumbed to his blandishments because they had no idea of what science is about.

We have chiropractors whose science would make a 12th grade physics student blush. Yet, they receive third party payment for their bone crun-

ching without a single, well-designed study that suggests that any of their manipulations have any positive benefits. Again, ignorance of the ways of science has entrapped even our best brains into believing that because a hand on the back may feel good, that the chiropractor is altering any part of the body for good.

And the cruelest pseudo-scientific scams involve patients with cancer who seek out Laetrile merchants, immune serum panderers, among others. "I was dying when I went to the Bahamas," cries one patient, "and now I am free of cancer." Never mind that nobady else has been able to repeat the cure on anybody else: never mind that there is no verifiable data: forget about controlled studies. It took mainstream cancer specialists 50 years to realize that without controlled experiments they could not say with assurance that substance A or method B improved a patient's condition one iota. Thus 50 years after Halstead, a morphine addict, developed the radical mastectomy, do we finally learn that perhaps for the majority of women with breast cancer a simple lumpectomywould have not only preserved the breast but give women a better chance of life. A controlled experiment did it -- some patients had radicals, some lumpectomy and the results compared.

We don't seem to have enough confidence in the data of science in part because old truths are often superseded and included by new truths so that it looks as though science cannot find the ultimate truth. No, scientists cannot find any ulimate truth; they trade in a succession of truths, each seeming to encompass more of the world. Old theories never die: they are engulfed by new theories and new data.

It would seem that the triumph of scientific methods in so many areas would encourage many to adopt the habit of scientific thought in everyday life, prompting us to ask, when proferred a miracle anything, where are the data? Who else has done this? Were the data controlled? How was it measured? Can I see the numbers?

I cannot leave this assignment without dealing with the new ethics arising from modern biological and medical research. With our ability to keep patients breathing and their hearts beating long after their brains have given up the ghost, we face new definitions of death. In short we know that brain dead is just as dead (perhaps more so) than heart dead. Yet only a minority accept the definition (a minority not including many physicians). The short term result of such belief is that we do not have enough donated organs, as relatives fear to turn in their loved one's body for organ harvest.

I used to say I have an easy answer for the abortion dilemma: let the physician, I declared, take the baby from the womb at any time and then keep it alive if he or she can. Since keeping a four month-old fetus alive was hopeless, the doctor in effect would have performed an abortion. But now it's not so hopeless any more. Premature infants are being kept alive at younger and younger ages and smaller and smaller weight. What will happen when scientists develop the mechanical womb? I leave you to address that question.

Such issues abound in medicine: what is informed consent to an operation? Should American-donated organs go to Americans first? When do you pull the plug? Should a hopelessly ill patient be allowed to go quietly? Should we help them along, as Betty Rollin did her mother? Should you mess with genes?

I cannot leave either, without mentioning the premier discoveries of this century -- nuclear fission and fusion, both of which have provided unprecedented killing power. Such power is bad in and of itself: it needs no rationalization. Scenerios abound in which a nuclear rocket exchange could leave the planet scarred and empty of our species.

I am worried. I wish I knew some answers that would be adopted by all parties. An old belief about the permanence of the human species now no longer can be held with the authority with which it was formerly pronounced.

We are all learning new vocabularies and new ideas from the unstoppable development of science and technology. Our beliefs in many areas are changing. But science and technology, fueled by their success, go on in greater intensity. Is this good? 1 believe so.