The splitting of the atom has created a new world for mankind—a world divided between fear and hope. The fear is perhaps comparable to the fears of the native Americans when introduced to European civilization by the use of gunpowder; the present fears of the free and relatively rich countries are equally well founded. We did not need the satellites to remind us of the power now held by those who would destroy our freedom.

But the power which can destroy can be used to save us. It is a truism that Communism is bred in the miseries of the people. Those who live a marginal existence, who can look forward only to continued hunger, privation and disease and who have no understanding of economic facts, succumb readily to the spurious promises which lead them to believe that they can attain all they desire by a magic formula for government. It was the misery of the Russian and Chinese people that bred the Communists and enabled the leaders to gain success. We are now witnessing the struggle for control of the eastern hemisphere where ignorance and misery invite our foe to enter. Almost our sole hope for the future lies in raising the standard of living of these submerged populations. This can be done if we are given time.

Atomic fission contains potentialities for peaceful use as well as for destruction. Scientific progress has enabled our part of the world to attain a standard of comfort and well being unimaginable two centuries ago. Given peace, atomic uses can spread this prosperity over the world. The knowledge of scientists as to its capabilities is still in its infancy but they know enough to hold out the hope that the uses to which it can be put will enable mankind to overcome much of its disease and poverty.

Thus far we have done pitifully little. It is time for a concerted effort, both on the part of government and of industry. I have confidence that the system of uncontrolled scientific research in private industry, which has made this country outstanding in all production fields will, if given the opportunity, enable us to compete with any concentration of coerced scientific and industrial effort. Let us hope that this meeting will prove to be a milestone in progress. My own part is merely to outline some of the legal difficulties which will arise from the use of substances whose potentialities for both good and evil are beyond any hitherto known.

Present Uses

Aside from their use for projectiles, there are two current uses for the products of atomic fission. One is the use of isotopes for medical, agricul-
tural and industrial use; the other is the use of atomic fuel in reactors which transmit released energy into heat, which in turn is used to develop power which operates machines. There are problems connected with isotopes which, if not shielded, are as deadly as in proper use they are beneficial; but the present insistent legal problems are those connected with reactors. It is important for us to get this source of power into operation rapidly. In large parts of the world, where the sources of energy are small, these reactors—refined and improved—will make it possible for the people to free themselves from the economic chains which now exist. Even in England, with its coal supplies rapidly diminishing, their use may make the difference between progress and stagnation. The free world must be leaders in developing them. We cannot wait for atomic fusion, which is safe, but which still lies only in the future after years of scientific exploration. But there are two difficulties with the use of atomic fission by private organizations today in the United States. The first is most important. It is the fact that atomic fuel cannot now compete with our abundant coal and oil in the cost of producing power. Although the initial success of the first nuclear power station built by private enterprise in California indicates that successful competition may be just around the corner. Only a few forward looking organizations have been willing to trade dollars for experience.

Risks

Although the present lack of economic incentive in this country has proved a major road block, it was pointed out in the hearings before the joint Congressional Committee this year that the tort liability resulting from the operation of reactors was a major deterrent to further industrial use. Reactors involve dangers common to the use of high explosives with only partially understood qualities, and the potentialities for harm are far greater than any previously known. Any large company can afford to operate a plant to manufacture nitroglycerine or T.N.T., since the plant can be so arranged that if disaster comes, the area of destruction, and hence the liability for harm, is relatively small. But the atomic power which speeds the machines is the same power which actuates the horrifying bombs, a power containing two and one-half million times as much energy as an equal quantity of coal. As in the case of the bomb, it is not the immediate physical destruction by an explosion that is most to be feared. In fact, there is probably less risk to the area immediately adjacent to a reactor than to that adjacent to a powder factory, for the reactors themselves have strong containers, probably sufficiently strong to withstand an explosion, and around these are fragment-proof concrete and steel walls. It is likely that, with the amount of fuel used or stored, the worst explosions would do no more than ruin the reactor—a business risk in any hazardous enterprise.
But the possible destruction of the plant and immediately surrounding area is not the most important matter; rather, it is the fact that the products of the combustion of the atomic fuels are far more dangerous than anything hitherto known and that, let loose into the atmosphere, windborne, they may travel thousands of miles. Anywhere along the way, they may destroy any living organism. They may be carried to earth by air currents or rain, and, without the knowledge of the inhabitants, make the areas on which they fall deadly to those who occupy them. Pre-war horror stories pale before the thought of a force which can kill and disable thousands who are unaware of the menace.

It is true that such an escape is highly improbable if we are to take the experience we have or the words of those who know most. For fifteen years producing reactors, some with high power and large inventories, have operated in the United States with scarcely a personal injury and with no substantial deposit of radioactive substances outside the plant area. The few accidents have not caused harm beyond the plant. The experts minimize the possibility of an accident which would cause the destructive elements to break through and produce a holocaust. But that there is a chance of such an accident cannot be denied. Recently in England, only the prompt discovery that a reactor was leaking prevented a major disaster. The air testing which is made daily in the vicinity of reactors is an indication of the constant fears of those who operate them. We have had but comparatively little experience—and that under the most rigid supervision with carefully selected personnel, with safety rather than cost the prime consideration. We cannot tell what will be the experience with commercial installations, operating in a new field, competing for the relatively few knowledgeable persons, and with the almost inevitable let-down in precautions as familiarity breeds a feeling of safety. To be most useful, reactors must be placed where the power which they develop can be used. This means that they will be dotted over the country, not in the midst of cities, it is true, but at least within a few hundred miles of them. Further, whether or not the risk to those around them is illusory, we have the statement of the Commission that it has been an important factor in deterring the commercial users of power from entering the atomic energy field if common law liability for an accident is to be enforced.

THEORIES OF LIABILITY

Atomic Reactors as Nuisances

Before dealing with liability for escaping emanations, perhaps it would be worth while to look at the other liabilities of the operator. He may be subject to liability to his neighbors because of the tort rules which apply
to an amorphous group of situations described as nuisances. All occupiers of land are subject to a duty so to use it as not to interfere unduly with the enjoyment of the land of their neighbors. The name and the principles of nuisance have existed since the period when candlemakers were forbidden to ply their trade in cities because of the stench created. For the same reason that there is a nuisance when foul odors or excessive noise or smoke make neighboring land uncomfortable, there is a nuisance when a business is so operated as to create great risk to the neighbors. Thus a dilapidated house on the point of collapse or one which is a serious fire risk is a nuisance, as is the manufacturing or storing of nitroglycerine in a populous neighborhood. Such nuisances may be enjoined by the courts; if not enjoined, the owner is liable to his neighbors for any loss caused by the depreciation in the sales value of their property and for damages resulting from their discomfort in living near the source of danger. It is not clear that a reactor in even a sparsely settled community will not be a nuisance creating liability in favor of those whose property has diminished in value because of it. Bearing in mind the relatively slight experience with reactors and the terrible effects which one which has escaped from control will have, it may well be that the neighborhood for miles around will be shunned and that the land in the area will lose much of its market value. Scientists may decry the existence of substantial risk, but scientific appraisal is not the test by which the fears of the untutored can be judged. I suggest that the possible liability for the creation of a nuisance is the most immediate impact of the law of torts upon the operation of a reactor, and would certainly be invoked after a serious incident in any of the plants.

**Liability for Unintended Harm**

Whether or not there would be liability for the creation of a nuisance, there is no doubt that there is potential liability for the escape into the atmosphere of the products of atomic fission. It is this which has caused the soul-searching by those in charge of organizations which plan to build, to operate, or to supply the parts to, reactors, since by common law rules their entire assets might be wiped out by one medium-sized disaster. In determining liability for unintended physical harm, the common law weighs two fundamental interests. The first is in the security of our persons and of our possessions; the other is in our freedom of action and of production. The protection of the first requires that a person who has been harmed by the activity of another should be compensated by the other; the protection of the second requires that one who harms another while in the prosecution of a lawful enterprise should be liable to others only if he has failed to use that degree of care to avoid causing harm which a decent regard for the interests of others requires at any given time and place. The law is a re-
resultant derived from the competition between these two basic interests and concepts.

**Negligence**

Primitive law stressed security; one whose activity harmed another was required to make good the damage. Modern law, with its recognition that only by productive activity can man be saved from starvation and disease, has tended to deny liability except where there has been negligence; today this is the ordinary measure of one's liability for unintended harm caused to the interests of others by his activities. Negligence does not necessarily connote moral fault or personal dereliction. It does mean that for some reason—ignorance, inadvertence, or lack of consideration for others—a person has not measured up to the community standard in what he does, and thus has violated a duty of care to others. In the case of an employer it means that if an employee does a negligent act while performing his duties, the employer is responsible to third persons for harm resulting therefrom. It also means that the employer may be liable for any conduct which, in view of his position and the knowledge which he should have, a reasonably prudent man would believe creates excessive risk to others.

These are the rules which govern most of our activities, including those which—like the operation of automobiles—almost inevitably occasionally cause harm to others even when carefully conducted. On the whole, I believe the rules proper. A dynamic world requires profitable activity and science has provided us with the machines which produce the necessities of a reasonably happy existence but which also make life dangerous. To impose liability upon a person who has measured up to the standard of a prudent person is to penalize activity. A person hurt by the activities of one who has taken all reasonable precautions to avoid harming him is unfortunate, but no more so than if he were struck by lightning or drowned by a tidal wave. Furthermore, at least in all personal accidents, the injured person is a cause of his own harm in a factual sense, since it is his presence at the place of impact which makes the harm possible.

**Strict Liability**

Opposed to the negligence theory, which limits liability to situations in which the defendant is guilty of some legal fault, is the idea currently advocated by some that the one who actively causes the harm should be liable at all events. This is usually put on the ground that under modern conditions there is recourse against the employer of the one personally doing the harm and this employer is usually an organization, a manufacturing or transportation company, or a unit of government, which can add the amount of damages required to be paid to the cost of its operations and pass this
on to its customers or taxpayers; and that individuals likely to harm others can, and should, take out insurance which will protect them and their victims from economic loss. The loss will thereby be spread over the users of the commodities produced or the service rendered and will not fall upon the individual participants. I do not believe that this is a workable plan for the great mass of situations. Even in the activities in which the need for protection is greatest—as in transportation, which causes innumerable accidents—the difficulties created would be as great as those disposed of. An expanded social security system, in which the disabled victim of misfortune would be taken care of whether the disability arises from an accident caused by another human being, a natural force, disease or even his own negligence, is preferable for the purpose for which strict liability is desired—that is, to mitigate the disaster which overtakes persons seriously harmed.

I am stating my position because I shall urge that in the operation of reactors the limitation of liability to negligent conduct should not apply; it may add to the force of the suggestion that I am no friend of strict liability—that is, liability without legal fault—as applied to activities in general. But there are a few situations in which it is feasible and just to apply a rule of strict liability and in which the courts have applied it. Its extent in American law is arguable. The 19th century break-away from liability only from negligence was made in the famous English case of *Rylands v. Fletcher*, decided by the House of Lords in 1868. It was held that the owner of a reservoir, the water from which percolated into an adjoining mine, was responsible for the flooding of the mine on the ground that he had made an unnatural use of the land. This doctrine as to unnatural use has been translated in American cases into a rule, accepted in some states, that one who is engaged in an enterprise which contains within itself risks of great magnitude is liable for a result harmful to others although unexpected and not preventable by the exercise of even extreme care. This is substantially the rule stated in *Restatement of Torts* sections 519 and 520. The situations to which the doctrine applies are those involving the use of explosives or poisons, or the collection of large quantities of explosives, water or gas, which create a risk, although a slight one, of danger approaching holocaust proportions. There has been disagreement as to the area covered by the doctrine. Dean Prosser, and, I presume, all who believe that strict liability should be the general rule, include within it many cases which I interpret as involving legal fault—such as unnecessarily storing quantities of explosives or inflammables in a congested area. These cases appear to me to fall within the concept that one who creates an unreasonable risk is negligent.

* (1868) 3 H.L. 330.
 Strict Liability

But whatever are the cases which are urged in support of a doctrine of strict liability, the reactor situation falls squarely within the usual interpretation both of the English rule—that is, the unnatural use of land—and of the American rule. The risk is incalculable. We are dealing with a tremendous force of which we have much to learn. We know only that it has potentialities of great harm. In a very real sense these reactors are part of the national program for self-defense; this program is the primary reason for their present existence. The victims of a possible explosion should be protected against disaster as we now protect soldiers injured in line of duty and their dependents.

By the most recent legislation,† which amends the Atomic Energy Act of 1954, reactor operators are required to obtain insurance to an amount specified by the Commission, varying with the size of the reactors, perhaps between 50 and 100 millions for the larger ones. Above that the government will indemnify and hold harmless “the licensee and all other persons indemnified as their interest may appear.” The ceiling of governmental liability is fixed at 500 million. If damages exceed the total of private and governmental liability, this amount is to be distributed pro rata among the victims. It may be noted that limiting liability appears to come within the bankruptcy power of the federal government, as well as within other national powers. It may also be noted that the amounts provided indicate risks of holocaust proportions.

This amendment is a great advance and meets the most pressing needs. But it still leaves the basic question of tort liability to be determined by state and not by federal law. By the rules of conflict of laws, the law of the state in which the harmful impact occurs is normally that which determines liability. Since a sizeable reactor is likely to cause harm in a number of different states, it is not unlikely that there would be different bases for liability and almost certainly different amounts of recovery for identical harm. I would like to agree with Dean Prosser that all state courts would apply the theory of strict liability, but a court which is thoroughly committed to limiting tort liability to faulty conduct may not do so. In this matter which is national in scope and vital to our national defense, there should be a uniform rule. For the reasons given, this uniform rule should impose strict liability. Those engaged in the enterprise are protected against disaster by the insurance and indemnity provisions of the present statute. A rule of strict liability would give to the victims of an incident the protection to which they are entitled against risks so great that only national necessity

can justify them. This matter should not be left to the discretion of the Atomic Energy Commission. In the present statute, the Commission can make the granting of a license conditional upon the waiving of any immunity which the reactor operator has, such as the outmoded and disappearing immunity which eleemosynary institutions still retain in some states. It is not clear why the Commission should be able to discriminate between non-profit organizations. The decision as to the general base of liability should be made by Congress and should be uniformly applied. In view of the likelihood that most states would adopt a rule of strict liability even in the absence of legislation, I would suppose that a statute imposing that liability would not increase insurance rates above those now contemplated. In fact if the modifications as to damages are made along the lines I shall suggest, the rates might be less.

Extent of Liability

There are other problems which should be considered and upon which it is desirable to have a statutory declaration to secure uniformity of decision, avoid useless litigation, and secure fairness both to the victims and to those who will bear the financial load, the taxpayers and the consumers. First, for what and to whom is there liability? Among the intricate rules which apply to actions for negligence is a group of rules generally given the label "legal cause" or "proximate cause." One of these rules is to the effect that if the intervening act of a third person operating upon a condition created by the defendant is the immediate cause of a harm, the intervening act "insulates" the defendant from liability if the chance of its occurrence was slight. Whether or not this rule will be carried over into the field of strict liability is doubtful. In the initial case of Rylands v. Fletcher, mentioned earlier, it was said by way of dictum that there might be no liability for the operator of an enterprise if the harmful result was immediately caused by the intervening act of a stranger or by an event technically known as "an act of God." Thus if an aviator were to fall upon a reactor and thereby cause the escape of radioactive particles, or if an earthquake were the immediate cause of such escape, existing cases do not make it clear that the reactor operator would be liable to the persons harmed. The statute should resolve this doubt in favor of liability; it is the risk inherent in the enterprise which creates the liability and it should be immaterial that the event which triggers the catastrophe is unexpected and unavoidable.

I do not mean, however, that there should be liability to all those who have suffered loss because of the catastrophe. There are many indirect losses, as well as profits, which are likely to result. Manufacturers and merchants outside the devastated area will lose customers who have been
killed or whose business premises have been destroyed. By existing tort rules, one who suffers merely economic loss caused by the destruction of the person or property of others who are in business relations with him is not entitled to damages from the one who caused the destruction. There appears to be no reason to change this rule. To attempt to compensate all who have suffered resultant losses would be impractical and would involve endless litigation. For those within the devastated area, however, there should be recovery for business losses. Thus the manufacturer whose plant has been destroyed should have compensation for the interruption caused by its destruction; a person who, like the Texas gasoline distributor, becomes contaminated and is avoided by his former customers because of this is entitled to damages for the loss of business even though his customers' fears are groundless. The statute should make definite the line between those who are and those who are not entitled to damages.

Uniform Damages with Limitations

The great mass of cases will involve physical harm to human beings and in this area legislation is highly desirable. First is the matter as to the amount recoverable for causing death, as to which the state rules vary widely. In Massachusetts, for example, the limit is 20,000 dollars, the specific amount being determined not by the loss to dependents but by the degree of the defendant's fault. By way of contrast, a New York widow recently obtained a verdict for $300,000 for the death of her husband. It is impossible to argue that both results are consistent with fairness to the persons involved. To permit such wide differences to prevail in actions resulting from an incident which causes death in each of several states would be shockingly inequitable.

Further, I suggest that it is desirable not only to have one level of damages but also that the existing rules of damages given for personal injury should be modified. At present, an injured person is compensated for his economic loss—that is, the additional expenses and losses resulting from the diminution of his earning power, before and after trial. In addition he is given an amount for the pain which he undergoes; this amount is within the reasonable discretion of the jury. This latter element of damages is proper when a defendant has been guilty of a wrongful act or at least where his act has been consciously wrongful, although of course there is no correspondence between pain and the amount of money received because of it. But for injuries resulting from the non-negligent operation of reactors for which recovery is allowed only because of strict liability, this element of damages should be omitted and only economic loss considered. It is just to deny this element, since the defendant has done no wrongful act and the activity is justified by public necessity. Compensation should be given to
avoid poverty and economic distress, as under Workmen's Compensation statutes. Likewise, in order to minimize litigation it may be feasible to have a scale of damages for specific harms as in the usual Workmen's Compensation Act. There are other damage questions which may be considered. Thus, although the liability for negligent treatment by physicians of an injured person and the rules as to avoidable consequences are in general adequately dealt with by common law rules, it may be desirable to secure uniformity of decision by a statutory rule.

Subsequently Discovered Harm

There is also the matter of statutes of limitations. There is no uniformity among the states as to the length of the period during which they run. Further, and more importantly, these statutes are not well adapted to take care of radiation injuries. As presently worded, most of them, except those with reference to fraud and to occupational diseases, begin to run from the time of the harmful impact. The diseases which result from radioactive substances may not be discovered for years after the impact. In fact, until the disease becomes manifest its victim may have no realization of the radiation. I suggest that the federal statute should include a provision which would enable suit within a reasonable time after the disease or disability is discovered or should have been discovered in the exercise of reasonable care. Further, since the immediate consequence of radiation is frequently only apparently minor harm for which an action might or might not be brought, the statute should provide for compensation for a subsequently appearing but unpredictable harm. The present rules of res judicata prevent a subsequent action if judgment has been obtained in an action based on the impact, although at that time, the harm appeared to be minor. Perhaps it would be better to provide for installment payments, to be increased or diminished as subsequent events determine the extent of the total harm.

Builders and Suppliers

Thus far we have been considering only the liability of the reactor operator without reference to two other groups who are drawn into the picture. These are the builders of plants and the suppliers of materials and parts. Under existing rules of negligence, the operator is under a duty of care to discover defects in the building in which he conducts his activities and to inspect supplies which he obtains from others. With reactors, it can be assumed that this duty might well extend to an inspection during the progress of the work by the builder or supplier. But whether the plant operator is or is not negligent, both builders and suppliers are, in most states, liable to persons harmed as a result of their negligence. Assum-
ing strict liability for the operator, it would be immaterial to the victims whether the operator or a supplier was negligent. With a negligence theory, however, it would become of great importance to discover who was at fault, a task which might be almost impossible. At all events, an operator who could prove that it was not negligent but that the builder or supplier was, would have a right to indemnity not only for damages paid to others but also for physical harm to the reactor and for loss of business. In fact, the operator would probably have this right even if negligent in inspection. This is a matter which should be taken care of by the agreements as to the building or supplying of the reactor, including the requisite insurance, but may properly be dealt with in the statute: it might be provided that the insurance coverage would protect all participants against claims from each other as well as against claims from third persons.

CONCLUSION

There are other matters which pose serious problems for the discussion of which time does not permit. Thus if negligence is required for liability, as may be the case under the present statute, will the amorphous and frequently misunderstood rule labelled “res ipsa loquitur” be a sufficient base on which to find negligence from the unexplained escape of dangerous particles? And proving damages which may not become visible until long after an impact has occurred may become very difficult.

It is obvious that many legal headaches lie ahead. Some of these can be obviated by further wise legislation which should be framed for the triple purpose of securing the avoidance of unnecessary litigation, the rapid development of nuclear power, and justice to the victims of our national necessities. The statutory provisions suggested above appear to me to be essential to effectuate those purposes; it is probable that there are others which would appear upon a thorough consideration of the problems. The advice of experts in science, medicine, insurance, and procedure are a requisite to the best solutions to these problems.