A. Product Liability

1. Introduction

Ascertaining the potential liability of designers, manufacturers, wholesalers, retailers, and suppliers of goods and services in an atomic energy industry is extremely difficult. This is due in part to the fact that the theories of liability are in a state of ferment and in part because there is a confusion between tort and contract law concepts and the application of each in particular fact situations. Out of the confusion, we can draw one conclusion. There is a marked tendency to provide compensation to persons injured by defective chattels or services by the imposition of a type of "enterprise liability," apparently on the assumption that suppliers can shift the economic loss through price increases and by obtaining liability insurance coverage.

The importance of determining the extent of liability under existing legal doctrines is perhaps obvious from the standpoint of obtaining recoveries for persons injured by atomic radiation and also of advising entrepreneurs of desired insurance coverage and of possible measures to limit liability. Nonetheless, a few hypothetical questions may indicate some problems that will have to be dealt with by lawyers in the atomic age. Will or should the designer of a nuclear reactor be liable for injuries caused to persons subjected to radiation outside the facility? Will or should the manufacturer of radioisotopes be liable for injuries caused as a result of leaks in packaging even though a wholesaler or retailer had control over the goods after the manufacturer? Will or should the supplier of a mechanical device used in conjunction with radioactive materials be liable for radiation injuries caused by a defect? Does it make any difference if the supplier had no knowledge that his product was to be so used? What is the effect of failing to warn a purchaser that a radioisotope should not be used for particular purposes? What duty rests on the manufacturer or supplier to know the propensities of his product for causing injury? What liabilities may be imposed as a result of statements made in advertisements? Can the scope of liability for defects be limited by disclaimers and notices? These are only a few of the many questions that must be answered. Some conclusions can be
drawn on the basis of analogous cases involving product liability in other types of endeavor. Therefore, we shall proceed to discuss some of the significant features of the law governing the liability of suppliers of goods and services, emphasizing throughout the landmark and frontier cases and their possible applicability in the light of specific atomic energy fact situations.

2. Negligence
   a. Historical Background

Although it is clear today in many jurisdictions that a supplier of chattels is liable for injuries to any person caused by his negligent conduct, this was not the case less than a century ago. The liability of suppliers for injuries caused by defects in chattels was considered to extend only to those who were in privity with the supplier under the contract of sale. Since this evolution in doctrine is of comparatively recent origin and since there continues to be considerable doubt in some jurisdictions as to the applicability of negligence and strict liability doctrines, a discussion of the landmark cases will be helpful in supplying the necessary perspective to deal with the new atomic energy situations.

The rule of law to the effect that the supplier of chattel was not liable to persons not in privity was first announced in the English case of Winterbottom v. Wright.\(^1\) There the defendant had contracted with the postmaster general to furnish a mail coach and keep it in repair. As a consequence of the defendant’s negligent failure to keep the coach in repair, the driver, who was in the employ of another contractor with the postmaster general, was injured. Lack of a contractual relationship between the driver and the defendant was held to preclude liability, because “unless we confine the operation of such contracts as this to the parties who entered into them, the most absurd and outrageous consequences, to which I can see no limit, would ensue.”\(^2\) This rule of law protected the supplier from bearing certain burdens, but it failed to provide any redress for the persons injured by the supplier’s negligence.

Only ten years after the Winterbottom case, the New York court in Thomas v. Winchester\(^3\) made an exception to the rule of no liability to third parties. In that case the defendant negligently mislabeled, as a harmless medicine, a jar of a poisonous extract of belladonna. The plaintiff had purchased the poison from a physician who had obtained

\(^2\) Id. at 114.
\(^3\) 6 N.Y. 397, 57 Am. Dec. 455 (1852).
it from a druggist who in turn had purchased it from the defendant. In allowing the plaintiff to recover, the court distinguished the fact situation from those in which a rule of non-liability prevailed, stating:

No such imminent danger existed in those cases. In the present case the sale of the poisonous article was made to a dealer in drugs, and not to a consumer. The injury therefore was not likely to fall on him, or on his vendee who was also a dealer; but much more likely to be visited on a remote purchaser, as actually happened.4

The second landmark case in the development of the doctrine that persons not in privity with a supplier could nonetheless recover damages for injuries under negligence theories is *Huset v. J. I. Case Threshing Machine Co.*5 In allowing recovery to an employee of the purchaser of a threshing machine which was inadequately shielded, the court outlined three exceptions to the general rule of no liability in the absence of privity. These exceptions, which were to exert considerable influence in future litigation, were said to be:

The first is that an act of negligence of a manufacturer or vendor which is imminently dangerous to the life or health of mankind, and which is committed in the preparation or sale of an article intended to preserve, destroy, or affect human life, is actionable by third parties. . . .

The second exception is that an owner's act of negligence which causes injury to one who is invited by him to use his defective appliance upon the owner's premises may form the basis of an action against the owner. . . .

The third exception . . . is that one who sells or delivers an article which he knows to be imminently dangerous to life or limb to another without notice of its qualities is liable to any person who suffers an injury therefrom which might have been reasonably anticipated. . . .6

In analyzing the court's statement of the exceptions, Professor Bohlen forcefully brought out its incongruities.7 He observed that under the court's formulation of the rule, manufacturers of chewing tobacco and drinks would be liable to persons not in privity, but the manufacturers of automobiles, high-powered machines, boilers, etc. would not be liable for negligence since such articles are not intended to affect human life and are not imminently dangerous in their use when free of defects.

4 Id. at 409.
5 120 Fed. 865 (1903).
6 Id. at 870-871.
7 Bohlen, "Liability of Manufacturers to Persons Other than their Immediate Vendees," 45 L.Q. Rev. 343 (1929).
Perhaps the best known case in the area of liability of manufacturers to third parties is that of *MacPherson v. Buick Motor Company*, in which Justice Cardozo wrote the opinion. There the plaintiff was injured when a wheel collapsed on a car manufactured by the defendant and purchased by the plaintiff through a dealer. Although the wheel came to the defendant from a supplier, the defect was such that reasonable inspection would have disclosed it. In holding the defendant liable under negligence doctrines, the court said:

We hold, then, that the principle of *Thomas v. Winchester* is not limited to poisons, explosives, and things of like nature, to things which in their normal operation are implements of destruction. If the nature of a thing is such that it is reasonably certain to place life and limb in peril when negligently made, it is then a thing of danger.

The court, however, did indicate some limitations on this test, by stating:

If to the element of danger there is added knowledge that the thing will be used by persons other than the purchaser, and used without new tests, then, irrespective of contract, the manufacturer of this thing of danger is under a duty to make it carefully. That is as far as we are required to go for the decision of this case. There must be knowledge of a danger, not merely possible, but probable. It is possible to use almost anything in a way that will make it dangerous if defective. That is not enough to charge the manufacturer with a duty independent of his contract. . . . There must also be knowledge that in the usual course of events the danger will be shared by others than the buyer.

The culmination of the establishment of a general rule of liability of manufacturers based on negligence was reached in *Carter v. Yardley & Co., Ltd.* by the Massachusetts Supreme Judicial Court. In that case, the plaintiff, a remote purchaser, had been injured by the use of perfume manufactured by the defendant. The court swept aside the distinction between things "inherently dangerous" and others not so, stating the rule to be as follows:

In principle, a manufacturer or other person owning or controlling a thing that is dangerous in its nature or is in a dangerous condition, either to his knowledge or as a result of

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8 217 N.Y. 382, 111 N.E. 1050 (1916).
9 Id. at 389.
10 Ibid.
11 319 Mass. 92, 64 N.E.2d 693 (1946).
his want of reasonable care in manufacture or inspection, who deals with or disposes of that thing in a way that he foresees or in the exercise of reasonable care ought to foresee will probably carry that thing into contact with some person, known or unknown, who will probably be ignorant of the danger, owes a legal duty to every such person to use reasonable care to prevent injury to him.\textsuperscript{12}

Instead of stating the rule in form of an exception to the general rule as established in \textit{Winterbottom v. Wright} the court stated:

The time has come for us to recognize that that asserted general rule no longer exists. In principle it was unsound. It tended to produce unjust results. It has been abandoned by the great weight of authority elsewhere.\textsuperscript{13}

Thus in slightly more than a century the law has been completely reversed from a doctrine of non-liability of manufacturers to persons not in privity by contract to a doctrine of liability for negligence. Not all courts have had occasion to enunciate the broad doctrine of the \textit{Carter} case, but it can be expected that in most jurisdictions liability based upon negligence will become the established rule of law. Although the negligence doctrine as applied to product liability situations seems to be established in most jurisdictions today, problems in its application still remain. Furthermore, there appears to be some tendency in the cases to impose what amounts to strict liability.

b. The General Nature of the Duty

In general, a supplier of chattels has a duty to use care and skill when a reasonable, prudent man occupying the position of the supplier would recognize that a failure to use such care and skill would cause an unreasonable risk to other persons.\textsuperscript{14} This duty is owed to every person who may foreseeably be injured by a failure to exercise the care and skill required.\textsuperscript{15} The duty may be breached by several types of acts, including a failure by the supplier to disclose the unfitness of the chattel for the purchaser's purpose, a failure to exercise reasonable care in manufacturing or inspecting the chattel, a failure to produce a safe product as a result of errors in design, a misrepresentation of the quali-
ties of the chattel or their fitness for a particular purpose, or a sale to a person who is incompetent to handle the chattel safely. Because of the several forms which the negligence may take, the duty owed by the supplier is often phrased more specifically in the cases and in discussions of the product liability field. For example, the duty may be described as a duty to disclose defects in the product or its dangerous nature or as a duty to inspect. Thus, the general duty owed by suppliers of chattels is not expressed judicially, but it can be derived from an accumulation of the principles developed in the cases. Nonetheless, it is clear that suppliers in the atomic energy industry undertake duties in respect to their goods, a breach of which will result in the imposition of liability under negligence doctrines.

c. By Whom Is the Duty Owed?

The general duty to exercise reasonable care in conjunction with supplying chattels extends to manufacturers, wholesalers, retailers, lessors, bailors, donors, and even repairmen who return chattels with knowledge of defects due to the repairs they were employed to undertake. In addition, it should be noted that the manufacturer may be held liable for negligence, even if he did not produce the defective article but incorporated it into the final finished product.

In connection with the atomic energy industry, the duty will extend to all manufacturers, wholesalers, and retailers of nuclear devices. Perhaps more important, however, is the fact that suppliers of non-nuclear devices which are used in conjunction with reactors may subject themselves to tremendous liabilities if the failure of the device results in a major nuclear accident. Thus, the unusual feature of the supplier's liability in atomic energy is the vastness of the potential liability. For example, the supplier of a defective gear may normally expect to incur liability, but in all probability it will be confined to employees of the purchaser and occasionally a limited number of other third parties.

16 Prosser, Torts §83 (2d ed. 1955).
17 See Restatement, Torts §388, and the several comments thereunder.
18 Restatement, Torts §388, comment c (1934); James, “Products Liability,” 34 Tex. L. Rev. 44, 45 (1955), especially at Note 8 where cases are cited in which donors have been held liable as well as cases which are contra. See also Prosser, Torts §83 at 493 (2d ed. 1955), indicating Dean Prosser's opinion that the gratuitous bailor or donor only has the duty to disclose dangers of which he has knowledge.
However, supplying a defective gear which causes a nuclear accident may cause injury to hundreds and even thousands of persons, as well as causing substantial property damage.

Because there is a practice in the atomic energy industry for one group to design reactors or reactor components and another to engage in their manufacture or construction, a question arises as to whether the designers owe duties equivalent to those of the manufacturers of the product. The Restatement of the Law of Torts 21 and Professor James 22 both take the position that negligence in design is a basis for recovery against the manufacturer even where the product was designed by others, although Professor James acknowledges that the courts have been reticent in allowing recovery in cases based upon negligence in design where the manufacturer was responsible for the design. 23 We are unaware of any cases holding a designer, as distinguished from a designer-manufacturer, liable to third persons injured as a result of use of a chattel. In the case of architects the courts have refused to allow recovery by third persons injured by defects in design. 24 However, as we shall note later in this chapter, the courts have generally followed more restrictive rules in cases against building contractors and have not allowed recovery when the building has been accepted, apparently on the basis that the contractor has no control over subsequent acts concerning the realty and because of the lack of privity. When third parties have initiated actions against architects for negligence in design, recovery has generally been denied on the same theories employed in the building contractor cases. In contrast, the owners of the premises have been successful in obtaining recovery for injuries caused by the negligence of the architect. 25 However, in 1956 an Appellate Division of the Supreme Court of New York held that an allegation of negligence by an architect causing injury to a third person stated a cause of action. 26 Furthermore, the New York court even suggested that the architect may be liable and the building contractor not liable because the building contractor may have been justified in relying on the plans and specifica-

21 Restatement, Torts §§389, 398 (1934).
22 James, "Products Liability," supra note 18 at 50 et seq.
24 See e.g., Geare v. Sturgis, 14 F.2d 256 (1926).
25 See Annotation, "Responsibility of one acting as architect for defects or insufficiency of work attributable to plans," 25 A.L.R.2d 1085 (1952).
Therefore, the question of liability for negligence in design of designers of chattels who do not also manufacture the product remains doubtful. Nonetheless, we are of the opinion that the ultra-hazardous nature of an improperly designed atomic device may lead the courts to employ general negligence doctrines in suits by third parties against designers. Moreover, the general trend of the law in the field of product liability has been to broaden the field of application of negligence concepts. Therefore, we conclude that there is considerable likelihood that designers of chattels for atomic industry will be held to a general duty similar to that owed by manufacturers.

One additional factor should be noted. The specific nature of the duty owed by the various types of suppliers may differ. For example, a retailer or wholesaler may not be subject to the same duty to inspect a product as the manufacturer. Similarly, the manufacturer may not be under a duty to disclose to an ultimate purchaser the unsuitability of his product for the particular use contemplated by the purchaser whereas the retailer may be under such a duty when he knows of the contemplated use.

In the field of atomic energy a special problem exists because of the activity of the federal government. The Atomic Energy Commission actively engages in the production and marketing of radioactive by-product materials, and the United States is the exclusive owner of special nuclear material.27 Furthermore, under contract arrangements the AEC may supply research facilities, possible designs, and fuel refabrication services. As a supplier of goods, is the United States liable for negligent acts on the same basis as private suppliers? Since the government can be held liable only to the extent of the waiver of its immunity from suit, the answer lies in the applicable provisions of the Federal Tort Claims Act.28 Generally, if injury results from the performance of other than a discretionary act upon the part of government officials and employees, the government has waived its immunity. Therefore, it would appear that if the AEC supplies a negligently mislabeled radioisotope, the government may be held liable. However, if the negligence consists of improperly licensing an unqualified person, the government probably cannot be held liable because of the discretionary nature of the

27 Section 53e of the Atomic Energy Act of 1954, as amended in 1957, requires that special nuclear licenses be subject to the condition that the licensee "hold the United States and the Commission harmless from any damages resulting from the use or possession of special nuclear material by the licensee" except to the extent that the indemnification and limitation of liability provisions of the act apply.

negligent act. An additional question is whether governmental liability under the Federal Tort Claims Act can be based solely upon ownership of special nuclear material, absent any showing of negligence. In the Texas City litigation, the Supreme Court answered this question negatively:

... [T]he statute requires a negligent act. So it is our judgment that liability does not arise by virtue either of United States ownership of an "inherently dangerous commodity" or property, or of engaging in an "extra-hazardous" activity.

d. To Whom Is the Duty Owed?

When the courts in the last century required privity as a condition to recovery for injuries occasioned by negligence in supplying a chattel, the purchaser could, of course, fulfill that requirement in an action against his immediate supplier. However, in the MacPherson case an ultimate purchaser was allowed to recover from a remote vendor, and since the date of that case the principle of liability for negligence has been gradually extended to cover members of the purchaser's family, the purchaser's employees, other users of the product, casual by-standers, and even second-hand purchasers of the product. However, not every jurisdiction has had occasion to consider the extension of negligence doctrines to include non-users of a product, so some doubt exists as to the exact legal situation now prevailing. For example, the Washington court has declined to hold a repairman liable to a guest-pas-senger for negligence in the repair of an automobile, but the Kentucky and Wisconsin courts have reached an opposite result. The trend appears to be to enlarge the class to whom the duty is owing and thereby to broaden the liability based on negligence doctrines.

Moreover, both the direct purchaser and in some cases the ultimate purchaser may also be able to recover on the basis of either express or

30 For an interesting discussion of the possible governmental liability, see Hearing before the Joint Committee on Atomic Energy on Governmental Indemnity, 84th Cong., 2d Sess. pp. 109-114 (May 16, 1956).
31 Dalehite et al. v. United States, supra note 29 at 45.
34 Prosser, Torts §84, p. 501 (2d ed. 1955).
36 Olds Motor Works v. Shaffer, 145 Ky. 616, 140 S.W. 1047 (1911); Flies v. Fox Brothers, 196 Wis. 196, 218 N.W. 855 (1928).
implied warranties. Recovery under warranty doctrines is based upon a contractual type of liability and, as such, results in the imposition of a kind of strict liability, as contrasted with negligence. Recovery on warranty theories will be discussed later in this chapter. The fact that a purchaser may in some cases recover under either doctrine (negligence or warranty) has resulted in confusion in the cases. In any event, suppliers of chattels in atomic energy industry must take account of both doctrines in ascertaining the potential scope of their liability and in devising methods of providing protection, either by limiting the basis for recovery in warranty through contract terms or by seeking adequate insurance coverage.

Because of the unusual nature of radiation, the most difficult question confronting suppliers of chattels in atomic energy industry is whether the duty is owed to remote non-users. Normally, a supplier whose negligence causes an accident can expect relatively few persons in areas immediately adjacent to the chattel to be injured. But this may not be the case in respect to defective chattels supplied in connection with operations creating radiation hazards. For example, if the negligence of a manufacturer of a reactor control mechanism causes the reactor to melt-down and release radiation into the atmosphere, personal and property damage of outsiders may be measured in millions of dollars. Moreover remote and unexpected injuries may ensue, as for example if a supplier's negligence causes injury to a person who eats fruit covered by radioactive wastes released several miles away.

Under ordinary negligence doctrines the duty to the remotely injured person is resolved on the basis of foreseeability. It would appear that once recovery based upon negligence is permitted, the same tests of foreseeability should be employed in the atomic energy product liability cases as used in other negligence cases. However, the Restatement of the Law of Torts and Dean Prosser depart from the usual foreseeability concepts employed in discussing negligence when they describe the liability of suppliers of chattels to third persons. Both express the liability of the supplier in terms of persons who may be expected to be "in the vicinity of the chattel's probable use." A literal application of these statements of the rule may suggest a more restrictive scope of liability for suppliers of products in atomic energy cases involving radiation injuries suffered in places far removed from the location of the chattel.

87 Prosser, Torts §§84, p. 497 (2d ed., West Pub. Co., 1955). As expressed in the Restatement, Torts §388 (1934), the supplier's liability is "to those whom the supplier should expect to use the chattel with the consent of the other or to be in the vicinity of its probable use."
On the other hand, use of this statement of the rule may result in even greater liabilities because the statement takes no account of the device employed in ordinary negligence cases of finding no duty in respect to the “unforeseen” injured person.\textsuperscript{88}

It is doubtful whether any distinction can be justified between the tests of duty in pure negligence cases and those applied to product liability cases. For example, in Margulies et al. v. Denner et al.\textsuperscript{89} the owner, the agent of the owner, the supplier of the product, the trucking company, and the truck driver were held jointly liable to a group of persons who, while subway passengers, inhaled chlorine gas escaping from a defective tank in a truck when the driver, upon noticing the escape of gas, stopped near a subway grating. It is difficult to conclude that the subway passengers were in the vicinity of the probable use of the chlorine gas; nonetheless the court found a duty on the part of the supplier to the passengers, apparently on the basis of ordinary foreseeability tests.

As we shall see, the dangerousness of the product also plays a role in determining the existence and nature of the duty.\textsuperscript{40} Accordingly, it can be expected that a supplier of radioisotopes who ships them in a defective container will be held liable to persons exposed along the shipping route. Moreover, all persons who may foreseeably be injured by radiation exposures caused by defective chattels will, in all probability, be found to be among the class of persons to whom a duty is owed, no matter how remote from the source of injury both in space and in time.\textsuperscript{41}

e. The Dangerous Nature of the Product

In the MacPherson case Justice Cardozo indicated that liability for injuries to third persons, not in privity, would be imposed if the manufacturer knew or should have known that the product was a “thing of danger.” A thing of danger was defined as a product which is “reasonably certain to place life and limb in peril when negligently made.”\textsuperscript{42} Other cases\textsuperscript{43} have also expressed the opinion that manufacturers would

\textsuperscript{88} See discussion of duty cases, supra Chapter III.

\textsuperscript{89} 185 Misc. 139, 56 N.Y.S.2d 856 (1945), aff’d 271 App. Div. 827, 65 N.Y.S.2d 441 (1946), aff’d 297 N.Y. 562, 74 N.E.2d 481 (1947).

\textsuperscript{40} See Restatement, Torts §293 (1934).

\textsuperscript{41} Although some courts apparently attempted at one time to confine liability of suppliers to personal injury cases, today similar rules are followed whether the damage consists of injury to the person or to property. See Todd Shipyards Corp. v. United States et al., 69 F. Supp. 609 (1947).

\textsuperscript{42} See quotes from the MacPherson case, supra at note 9.

\textsuperscript{43} See, e.g., Huset v. J. I. Case Threshing Machine Co., 120 Fed. 865 (1903).
be held liable in the absence of privity if the product is "imminently
dangerous" or "reasonably certain to place life and limb in peril." In some of these opinions there apparently is an intimation that
more than a simple breach of a reasonable standard of conduct is essen­
tial to establish liability of product suppliers. The dangerous nature of
a product, of course, aids in the establishment of whatever greater
breach of the standard of conduct may be required by the courts.

Because of the unusual dangers involved in radiation hazards, it
appears that certain products, such as radioisotopes, containers for
radioactive materials, reactor fuel elements, and reactor control systems, meet the "imminently dangerous" tests. On the other hand, such
products as electronic tubes, gears, bolts, pins, etc., which may be in­
corporated into a reactor do not seem to meet the tests. However, there
have been several decisions which have held similarly apparently in­
ocuous articles to be "imminently dangerous," even including such
normally innocent items as shoes, bar stools, and children's toys. These
cases represent the trend toward the application of ordinary negligence
doctrines throughout the field of product liability although the courts
still are basing their decisions on an exception to the old no-liability rule
as stated in the MacPherson and other similar cases. In any event, it
would seem that where the courts still employ the exceptions, as dis­
tinguished from ordinary negligence concepts, many of the products
employed in atomic energy industry would appear to fall within the
exceptions, and therefore it is doubtful if the suppliers can expect to
avoid liability.

The dangerous nature of a product may have yet another effect on the
duty owed. The burden may be imposed upon the product manufacturer
to discover the possible dangers, and this duty may greatly increase the
standard of reasonable care applicable in respect to dangerous products.
For example, in Chapman Chemical Co. v. Taylor, et al., a manu­
ufacturer of 2-4-D weedkiller was held liable to a person whose cotton
crop, which was located three-quarters of a mile from the place of spray-

44 U.S. Radiator Corp. v. Henderson, 68 F.2d 87 (1933).
45 See cases listed by James, "Products Liability," supra note 18 at 61.
Steel Corp., 266 App. Div. 866, 42 N.Y.S.2d 341 (1943). For a more complete listing
of the cases, see James, supra note 18 at 62.
47 215 Ark. 630, 222 S.W.2d 820 (1949).
ing by aircraft, was injured when wind caused the chemical to drift and settle thereon. At the time, the manufacturer knew of the danger of the chemical to certain crops but neither it nor other manufacturers apparently knew of the tendency of 2-4-D to drift farther than other types of agricultural chemicals. Nonetheless, the Arkansas Supreme Court approved the following instruction by the trial court to the jury:

It was the duty of the defendant Chapman Chemical Company before putting an inherently dangerous product on the market to make tests to determine whether or not it would damage crops of others; if you believe from a preponderance of the evidence in this case that the 2-4-D dust applied ... [by the purchaser] ... was an inherently dangerous product liable to damage property of others, and that such tests were not made, then you are told that the defendant Chapman Chemical Company is negligent.\(^48\)

It is apparent that the court felt there was a duty to make more complete tests in respect to "inhernently dangerous" articles. By its very nature, the additional duty, in effect, established a higher standard of care in dealing with the dangerous product. That the standard of care may be affected by the dangerous nature of a product is also indicated by the Restatement's conclusion that a supplier who knows that a product is unlikely to be made reasonably safe before being used is liable to users and others in the vicinity of use even though the supplier has informed the purchaser of its dangerous character.\(^49\)

For those products in the atomic energy field that can be described as "inhernently dangerous," it appears that additional duties and higher standards of care will be imposed by the courts. Which products may be so classified by the courts is a doubtful matter. As we have seen, some rather commonplace products have been so classified in certain instances. Radioactive materials having intermediate half-lives and emitting the more dangerous gamma rays will probably be classified as "inhernently dangerous." Perhaps short-lived isotopes or those emitting alpha and beta radiation only may not be so considered. Possibly distinctions may

\(^{48}\) *Id.* at 642.

\(^{49}\) *Restatement, Torts* §389 (1934). The section reads as follows:

One who supplies directly or through a third person a chattel for another's use knowing that the chattel is unlikely to be made reasonably safe before being put to a use which the supplier should expect it to be put, is subject to liability for bodily harm caused by such use to those whom the supplier should expect to use the chattel or to be in the vicinity of its probable use and who are ignorant of the dangerous character of the chattel or whose knowledge thereof does not make them contributorily negligent, although the supplier has informed the other for whose use the chattel is supplied of its dangerous character.
be drawn by the courts on the basis of the likelihood of ingestion of the particular material if it is harmful as an internal source of radiation. A radiation detection device may be classified as inherently dangerous or not, possibly depending on whether the supplier knows that failure of the device may lead to harmful exposure of employees and others to radiation. The lines will be drawn by the courts, often on the basis of whether the supplier is more capable of bearing the economic loss caused by the injury. However, this concept is seldom mentioned in the opinions although it is recognized as being a very material factor by most legal scholars. One statement may be made with some assurance; namely, although the dangerous nature of the product will have a material effect upon the standard of care required of product manufacturers, there is as yet no certainty about the extent to which it will affect suppliers of the various kinds of products used in atomic devices. The law on this subject will be shaped by future decisions.

f. Warnings of Danger and Assurances of Safety

There are a number of devices and products utilized in atomic industry which have dangerous aspects that are known to the supplier. For example, a processor of radioisotopes may supply tracers, some of which may be safely used for diagnosis and treatment of humans but others, harmful to humans, may be useful only in conjunction with insecticides. Similarly, a supplier of reactor components may produce a device which is suitable for thermal reactors but unworkable if used with fast breeder reactors. Suppliers of radiation detection instruments may know that certain devices may not be satisfactory for protecting personnel of the purchaser from certain types of harmful radiation. Moreover, because many aspects of atomic energy technology and the nature of injury to humans remain unknown, though knowledge is constantly expanding, and because the theories of atomic structure still are in a continuous state of evolution, suppliers of atomic energy products must necessarily rely on knowledge currently existing although it may be assumed to be incomplete. Since the suppliers may be held liable for their negligent acts, among the most crucial questions to be answered are: What warning must be given to the purchaser and user of atomic energy products? What liabilities may result from a failure to warn? What liabilities may result from giving assurances of safety when supplying an atomic energy product? What liabilities may result even though warnings are given to the purchaser? It should be noted that these questions involve the possibility of liability of a supplier in some
cases even though no negligence can be shown in respect to the design or manufacture of the product.

The importance of the necessity of providing warnings is indicated by the Restatement's general rule governing liability of suppliers:

One who supplies directly or through a third person a chattel for another to use, is subject to liability to those whom the supplier should expect to use the chattel with the consent of the other or to be in the vicinity of its probable use, for bodily harm caused by the use of the chattel in the manner for which and by a person for whose use it is supplied, if the supplier
(a) knows, or from the facts known to him should realize, that the chattel is or is likely to be dangerous for the use for which it is supplied;
(b) and has no reason to believe that those for whose use the chattel is supplied will realize its dangerous condition; and
(c) fails to exercise reasonable care to inform them of its dangerous condition or of the facts which make it likely to be so. [Emphasis added.]

Illustrative of the liability that may be imposed in conjunction with an inherently dangerous product where no notice of danger is supplied is the case of Noone v. Fred Perlberg, Inc. In that case the manufacturer of a dress which was sized with an inflammable material was held liable, the court stating the rule to be applied as follows:

The rule in this State is now settled that when a manufacturer sells an inherently dangerous article for use in its existing state, the danger not being known to the purchaser and not patent, and notice is not given of the danger or it cannot be discovered by reasonable inspection, the manufacturer is legally liable for personal injuries received by one who uses the manufactured article in the ordinary and expected manner. [Emphasis added.]

In Ebers v. General Chemical Company the defendant manufactured and marketed a new insecticide which the U. S. Department of Agriculture had tested in several states successfully. In its advertising, after giving directions for the use of the insecticide which was sold under the trade name E-D-E, the manufacturer supplied the following statement:

The foregoing information is supplied by us gratuitously and is believed to be reliable and of value, but is in no way

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50 Restatement, Torts §388 (1934).
52 Id. at 152.
guaranteed. The use of this material being beyond our knowl-
edge and control and involving elements of risk to vegetation,
we do not make any warranty, express or implied, as to the
effects of such use, whether or not in accordance with direc-
tions or claimed so to be.\textsuperscript{54}

The plaintiff applied the insecticide as directed but nearly one-fourth of
his orchard trees died. Evidence was introduced by the plaintiff show-
ing that in the following year both the defendant and the United States
Department of Agriculture had changed their directions for use to in-
clude a warning that the product should not be sprayed on the tree
trunks. The directions supplied to the plaintiff had recommended that
some of the chemical be sprayed on the trunk. Despite the disclaimer
the court held that the plaintiff has shown sufficient evidence of either
a failure to make satisfactory tests or a failure to provide adequate di-
rections for use to warrant submission of the case to the jury. In revers-
ing the lower court's ruling directing a verdict for the manufacturer,
the court stated:

\ldots If it was negligent in placing such product on the market
in Michigan without proper field tests to determine its effect
on peach trees in this State, or if it gave improper direction for
the use and application of the product, it cannot escape re-
sponsibility for such negligence merely by adding a disclaimer
of warranty to its representation of safety.\textsuperscript{55}

Both of these cases demonstrate the necessity of giving warning or
adequate directions for use to purchasers of products. The adequacy of
the warning or direction is, of course, a jury question, but it is clear
that the adequacy will be determined on the basis of knowledge which
should have been known.\textsuperscript{56} In the \textit{General Chemical Co.} case, the court
infers that this knowledge should have been derived by tests in Michigan
because of different climatic and soil conditions even though the product
had been tested in a number of other states by the Department of
Agriculture.

In addition, in \textit{McClanahan v. California Spray-Chemical Corp.},\textsuperscript{57} the
Virginia Supreme Court seems to have concluded that, even where the
directions for use of a fungicide were not followed, the manufacturer
had a duty to provide warnings concerning the possible damages in ad-

\textsuperscript{54} Id. at 268.

\textsuperscript{55} Id. at 274-275. See also E. I. DuPont de Nemours & Co., v. Baridon, 73 F.2d 26
(1934).


\textsuperscript{57} 194 Va. 842, 75 S.E.2d 712 (1953).
dition to supplying directions for safe usage. A pamphlet supplied by the defendant stated that the chemical was not to be used later than two weeks following petal fall, but the label on the container cautioned against use "later than petal fall." However, in both instances the directions inferred that the reason for the warning was "a possibility of residue remaining at harvest." In reversing the trial court, which had set aside the jury verdict for the plaintiff, the court stated, in part:

It follows then, that a manufacturer of an economic poison in giving direction for use is fulfilling only a part of his obligation to the purchaser. He is saying simply "Here is a way to use this product which we guarantee will kill the weeds infesting your lawn or the scab infecting your orchard." Of course, that way must be a safe way. The manufacturer by instructing how to use is not necessarily saying, nor is he understood by the purchasing public to say, "This is the only safe way to use our product." 58

Two justices dissented vigorously, stating:

The prohibition as to application "later than petal fall" was positive, simple and direct. It could serve no purpose other than to warn of danger upon violation, a warning with special meaning to experienced orchardists who know the condition of the foliage on their trees at the time of petal fall. No additional warning was necessary under the statutes. To say that there should have been added a statement "Use only as directed, and not otherwise or damage may result," is a reflection upon the intelligence of the plaintiffs.

* * * * *

... It having been established that no injury would have been incurred by plaintiffs had they observed the directions and caution statement on the label ... and the accompanying pamphlet, it must logically follow that their default was a proximate cause of the damage occasioned them. There is a question of wisdom and fairness of subjecting defendant to liability for damages under such circumstances. The majority opinion fashions a broad, new law of negligence in conflict with that which we have followed for many years,—one apt to cause embarrassment in the future. 59

The applicability of these cases to atomic energy entrepreneurs is readily seen. The supplier of a radioactive sterilizer or food preserver must

58 Id. at 862. The McClanahan case and several others concerning the duty to warn are ably discussed by Dillard and Hart, "Product Liability: Directions for Use and the Duty to Warn," 41 Va. L. Rev. 145 (1955).

59 Id. at 870-871.
not only provide directions for safe usage, but he may also be required
to warn against a possible dangerous usage, even though the Atomic
Energy Commission may have conducted experiments and even issued
statements concerning proper usage of the same or substantially similar
radiation sources.

A failure to give proper warning to the purchaser may also be the
basis for liability to third persons even if there is no evidence that the
manufacturer should have known of the danger at the time of the
purchase of the product, provided he becomes aware of the danger at a
later time. In *DeVito v. United Air Lines, Inc.*60 the plaintiff obtained
a judgment for wrongful death against the purchaser and manufacturer
of an aircraft, alleging negligence against the manufacturer for failure
to warn the purchaser that carbon dioxide may enter the cockpit of the
aircraft, thereby suffocating the pilots. The planes were purchased in
the spring of 1947 and the evidence of the carbon dioxide danger did not
come to the attention of the manufacturer until January 1948. The
manufacturer thereafter conducted tests but failed to tell the purchaser
of the potential danger and of the precautions to be taken to avoid suffo-
cation.

Suppliers of products either directly or indirectly employed in con-
junction with radiation sources may be subject to the extraordinary
duty, therefore, to keep abreast of the almost daily new technological
and theoretical developments in order to inform past as well as future
purchasers of their products whenever evidence of danger is known to
exist or should have been known to exist.61 The question of precisely
when a manufacturer may be charged with foreseeing harm so that he
has a duty to warn cannot be definitively answered. However, the courts
do not appear to have had too much difficulty in finding the duty where
the facts involved "inherently dangerous" articles, of which there are
many in the atomic energy industry. The burden placed upon manu-
facturers of new products in respect to the duty to warn and fulfilling
that duty is not an easy one, especially with respect to prior purchasers.
As stated in Dillard and Hart :

> In cases involving new products, it is thus clear that a duty
to warn will depend on the extent to which knowledge of the
danger should reasonably be attributed to the manufacturer.
If the product is launched prior to "adequate" testing, to at-

the defendant liable although he had no knowledge of the dangerous character of the
product since he did not manufacture the article but sold it under his name.
tribute knowledge would seem reasonable. Furthermore, if products like drugs are launched while still in such a clinical stage that the manufacturer cannot be sure of their effects, a warning of that danger would also seem necessary. Paradoxically, the manufacturer should then be required to give warning of what he does not know. The paradox is an apparent one only, since he does or should know that, in general, the product is capable of harm.

Clearly, we have here an area in which “law,” “scientific knowledge,” and the demands and price of “progress” sharply react upon one another. They do so in a way which makes rational reconciliation of conflicting interests unusually difficult. . . . [I]t would seem that the point at which the benefits of experimentation should be permitted to outweigh the rights of an injured plaintiff should be decided, not by a judicial balancing of interests, but by a common-sense jury determination of what was reasonably to be expected in view of the nature of the commodity and its foreseeable use.”

The full extension of this duty remains to be worked out in future decisions by the courts.

Even when warnings are given to the purchaser, or when warnings would be unnecessary because of actual knowledge of the danger on the part of the purchaser, the supplier may be held liable for failure to warn actual users of the product, including secondhand purchasers. For example, in Tomao v. A. P. De Sanno & Son, a manufacturer of a grinding wheel was held liable for injuries sustained as a result of his failure to indicate the maximum speed at which the wheel could be operated even though the defendant contended that the wheel was sold originally to the United States government. The court merely stated that it was foreseeable that the wheel might be acquired from the government by third persons. Similarly, in Beadles v. Servel, Inc., the secondhand purchaser of a gas refrigerator was allowed to recover for injuries because the manufacturer failed to provide notice of the necessity of cleaning certain component parts that had a tendency to clog after a lengthy period of operation. Where the warning has been given to the purchaser, but not to the actual user of the product, liability has also resulted. For example, in Rosebrock v. General Electric Company, the manufacturer provided a warning on the bill of shipment,
but failed to place a warning tag on the container to the effect that certain blocks placed in a transformer for shipment should be removed before use. The warning on the bill of shipment was filed by clerks and did not reach the personnel engaged in the unpacking and installation. The manufacturer was held liable for his negligence in not giving warning suitable for those persons who actually engaged in the installation process.67

Because of the dangerous nature of radioactive materials and devices using radiation, these cases demonstrate the probable high degree of care that must be used in giving warnings to purchasers and others who may come into contact with the products. Certain symbols and color schemes to denote radiation hazards have generally been adopted. Following the standards of the industry will undoubtedly be essential, but even these may not provide the kind of warning required to avoid liability. Adequacy of the warning is usually a jury question, with the results in specific cases always in doubt, especially because the standards imposed may be relatively high since radiation is not capable of detection by the human senses.68

If the manufacturer gives assurances of the safety of a product for the use intended, this fact alone makes it easier for injured persons to show negligence in fulfilling the duty to warn.69 Thus, even where a warning was attempted to be given by directions concerning the use of an inherently dangerous product, other statements assuring or even intimating assurance of safety have made it difficult for the supplier to show the exercise of reasonable care.70 Moreover, providing assurances of safety may give rise to a type of strict liability under theories of

67 See also Gall v. Union Ice Company, 108 Cal. App.2d 303, 239 P.2d 48 (1951). In that case there was evidence that a letter had been sent to purchasers of the product four years before the injury to the third party plaintiff warning of the danger. It also appeared that several lots of the same article had previously been acquired by the same purchaser and that the defendant had made a practice of attaching warning labels. However, in this instance, the defendant was held liable since there was no specific evidence that the particular article had a warning label.

68 See Farley v. Edward Tower Co., 271 Mass. 230, 171 N.E. 639 (1930), and Maize v. Atlantic Refining Co., 352 Pa. 51, 41 A.2d 850 (1945), as examples of cases showing the high standard of conduct for warnings that may be required and the dangers involved in advertising which may detract from the warning.

69 See Tingley v. E. F. Houghton & Co., 30 Cal.2d 97, 179 P.2d 807 (1947), in which the court upheld a verdict of liability of the defendant manufacturer to users for failure to warn. The court stated at 103: “There is a particular need for a sufficient warning where, as here, there is a representation that the product is not dangerous.

70 See e.g., Ebers v. General Chemical Co., supra note 53; E. I. DuPont de Nemours & Co., v. Baridon, supra note 55; and McClanahan v. California Spray-Chemical Corp., supra note 57
express or implied warranty which will be discussed below. Furthermore, certain statements of assurance of safety may occasion liability in a tort action on the theory of deceit.\textsuperscript{11} The courts have allowed recovery under theories of deceit even though an intent to deceive was not proved to exist.\textsuperscript{12} The classification of the cases as deceit, negligence, or warranty is often extremely difficult because there is an overlapping of theories of liability.

Representative of cases in which it is difficult to ascertain the precise theory of liability is the case of \textit{Baxter v. Ford Motor Co.}\textsuperscript{13} There the manufacturer had distributed to automobile dealers catalogues and printed matter containing representations that the car windshields were made of non-shatterable glass. The plaintiff was injured when a pebble thrown by a passing car struck the windshield causing a piece of the windshield to strike the plaintiff's eye. The court, holding the defendant liable, stated that the plaintiff "had a right to rely upon the representations" even though there was no privity of contract, suggesting a theory of liability based upon misrepresentation. However, at the same time the court cited a number of cases holding suppliers of chattels liable in the absence of privity because of the "inherently dangerous" quality of the product.\textsuperscript{14}

In \textit{Wennerholm v. Stanford University School of Medicine},\textsuperscript{15} the California Supreme Court upheld, as sufficient to state a cause of action, an allegation of fraud by the plaintiff who suffered blindness as a result of taking drugs manufactured by the defendant even though the drug was taken in accordance with a physician's prescription. The allegation of fraud was that the defendant had by publication in newspapers, circulars, and elsewhere represented that the drug was harmless, that the defendant knew that the drug was inherently dangerous and liable to cause blindness, and that the plaintiff had relied on the representations. The court stated:

\begin{quote}
The intent to deceive sufficiently appears . . . by the facts alleged, from which it may be inferred that the alleged false statements were made with the intention of inducing the public to purchase the drug.\textsuperscript{16}
\end{quote}

\textsuperscript{11} Prosser, Torts \textit{886} (2d ed. 1955).
\textsuperscript{12} 2 Harper and James, Law of Torts c. VII (1956).
\textsuperscript{13} 168 Wash. 456, 12 P.2d 409 (1932).
\textsuperscript{14} In a substantially similar case, the Michigan court founded liability on the basis of warranty where plaintiff alleged deceit and fraud, negligence, and breach of warranty. \textit{Bahlman v. Hudson Motor Car Co.}, 290 Mich. 683, 288 N.W. 309 (1939).
\textsuperscript{15} 20 Cal.2d 713, 128 P.2d 522 (1942).
\textsuperscript{16} \textit{Id.} at 716.
Cases are relatively rare, however, holding defendants liable to remote purchasers of chattels on theories of misrepresentation or deceit. The bases for liability of suppliers usually employed are either negligence or warranty,77 with the misrepresentation playing an important role in showing the breach of the standard of conduct required or in establishing the warranty. Theories of misrepresentation or deceit are used, however, to establish liability to a purchaser when the product will not serve the purpose for which it was purchased. For example, in *Horrell v. Santa Fe Tank and Tower Company* 78 the supplier was held liable for damages on the basis of a representation that his atmospheric-type cooling tower would cool the volume of water necessary for the purchaser's refrigeration processes.79 Liability of this type also holds warnings for suppliers to atomic energy industry because the unique technological problems involved may lead to representations of the suitability of a product which proves to be false. For example, an ordinary valve may be perfectly satisfactory for general industrial application, but because of susceptibility to corrosion it may be entirely unsatisfactory for use in conjunction with radioactive materials. Therefore, suppliers of standard products should exercise extreme caution in making representations concerning applications of their products in atomic energy operations.

It may be safely concluded that the duty to warn may be onerous for suppliers of articles which either employ radiation sources or are used in connection with nuclear processes. If the product is inherently dangerous, the cases seem to require a high standard of care in fulfilling the duty imposed. Moreover, we have also seen that the supplier may be held liable to third parties even if he has provided warnings to the purchaser. The extent of potential damage that may be caused by a defective component incorporated into a reactor is far greater than that encountered in more usual types of industrial pursuits, so suppliers to atomic industry should avoid unusual risks by exercising a very high degree of care in giving adequate warning to purchasers and so far as possible to third parties, thus assuring to the maximum possible degree that no accident will result from a failure to warn of the dangerous nature of the product.

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77 See Prosser, Torts c. 18 (2d ed. 1955); Restatement, Torts §525 (1934).
Suppliers of chattels may also be held negligent because of the probability that injuries will result from supplying chattels to incompetent persons. The rule, as explained by the Restatement, is as follows:

One who supplies directly or through a third person a chattel for the use of another whom the supplier knows or from facts known to him should know to be likely because of his youth, inexperience or otherwise, to use it in a manner involving unreasonable risk of bodily harm to himself and others whom the supplier should expect to share in, or be in the vicinity of its use, is subject to liability for bodily harm caused thereby to them. 80

This statement of the rule raises a number of problems for suppliers to atomic energy industry. It is generally realized that only highly trained scientific and technological personnel are equipped to handle the problems encountered in employing the fission process or radiation sources in research, medicine, or industry. Moreover, under the Atomic Energy Act of 1954 persons utilizing special nuclear materials (fissionable) or byproduct materials (radioactive) and operators of reactors must be licensed by the Atomic Energy Commission. 81 In respect to use of byproducts, licenses can be and are usually granted prior to the installation of the activity, but in connection with the utilization of special nuclear materials to produce electrical energy, the owners and their operators need not, and normally will not actually, receive their licenses until the installation is fully equipped and prepared for regular operation. However, the owner of a reactor must obtain a construction permit before building the facility. 82 To complicate the picture, the Atomic Energy Commission has promulgated regulations which establish general licenses for particular uses and quantities of radioactive byproduct materials. The existence of a general license, in effect, means that no individual license is required for certain activities although the participant may be required to comply with stated regulations. 83

The supplier of radioisotopes or devices directly or indirectly associated with the fission process or the utilization of radiation sources is confronted with several questions. Should the supplier demand that his purchaser have a license? If a license is not essential or if general licensing exists, must he investigate the competence of the purchaser?

80 Restatement, Torts §390 (1934).
82 Id. at §185.
Can he rely on the fact that a license has been issued to prove that he has not been negligent in supplying his product to the particular purchaser? If a construction permit has been issued for a reactor facility, must he investigate the degree of competence of the purchaser in view of the fact that the construction permit seems to require only a finding by the AEC that there is "reasonable assurance" that the facility will prove to be safe at a future date, namely at the time the reactor is ready for operation? Where the license is issued to a corporation, must he investigate the competence of the persons who will actually use special nuclear or radioactive materials? Obviously, these questions relate to a standard of care which must usually be resolved in relations to the facts of specific cases, so no definitive answers are possible.

Possibly, an examination of the cases establishing liability for supplying dangerous products to children or incompetents may, although they are not too closely parallel, serve to indicate how some of these questions may be answered when litigated.

Generally the cases establishing liability for what may be described as a breach of duty in selection of a purchaser have involved sales to children of firearms, fireworks, or inflammable substances or the lending of motor vehicles to persons who were known by the lendor to be either reckless or inebriates. Recently, a New York court upheld, as stating a good cause of action, an allegation that a wife was negligent in allowing her husband to drive her automobile when she knew that her husband had a dangerous heart condition. The plaintiff was injured when the defendant's car swerved to the wrong side of the road during a fatal heart attack suffered by the husband. Manufacturers have also been held liable for negligence because of illegal sales of explosives or dangerous products to retailers. For example, in *Milton Bradley Co.*

84 10 Code Fed. Regs. §50.35.
85 See *e.g.*, Neff Lumber Co. v. First National Bank, 122 Ohio St. 302, 171 N.E. 327 (1930); Bernard v. Smith, 36 R.I. 377, 90 Atl. 657 (1914).
86 See *e.g.*, Burbee v. McFarland, 114 Conn. 56, 157 Atl. 538 (1931); Bosserman v. Smith, 205 Mo. App. 657, 226 S.W. 608 (1920).
88 See *e.g.*, Herrman v. Maley, 159 Miss. 538, 132 So. 541 (1931); Slaughter v. Holzomback, 166 Miss. 643, 147 So. 318, (1933); Rounds v. Phillips, 166 Md. 151, 170 Atl. 532 (1934); Golembe v. Blumberg, 262 App. Div. 759, 27 N.Y.S.2d 692 (1941); but cf. *Estes v. Gibson*, (Ky) 257 S.W.2d 604 (1953), finding no liability because the transaction was a gift.
89 Schneider v. Van Wyckhouse, 54 N.Y.S.2d 446 (1945).
90 See cases cited in Annotation, "Liability of manufacturer or wholesaler for injury caused by third person's use of explosives or other dangerous article sold to retailer in violation of law," 11 A.L.R.2d 1028 (1950).
of Georgia, Inc. v. Cooper,91 the defendant wholesaler sold fireworks to a retailer in violation of a city ordinance. The son of the retailer took a torpedo toy, which explodes when thrown on the ground, from the store and threw it so as to explode near the plaintiff. The resulting explosion caused the plaintiff to lose the sight of his left eye. The Georgia Court of Appeals held that a cause of action had been stated and that the question of "proximate cause" should be determined by the jury. Moreover, sales in violation of statute are classified in many jurisdictions as negligence per se if the plaintiff is a member of the class, and the harm is of the type, designed to be protected by the legislation.92

We have discovered no cases which have imposed liability on a supplier for furnishing a dangerous product to an adult person even where there may have been knowledge that the adult person did not have sufficient technical skills to handle the product safely. However, it is possible that the courts may impose liability by analogy to the cases dealing with children if the supplier has knowledge of incompetence and the product is "inherently dangerous," such as radioactive materials. Probably liability would not be imposed in conjunction with sales of atomic energy products, not radioactive in themselves, nor would it be imposed if the seller has no knowledge of the incompetence. At the present time, it appears that the seller of atomic energy products has no duty to investigate the degree of skills possessed by his purchaser. However, if the sale is to a non-licensed person, where licensing is required, liability to the purchaser and others may be imposed because of violation of the statute, or the violation may create a presumption or constitute evidence of negligence.

Lack of knowledge or competence on the part of a purchaser may have some bearing upon the duty to warn. If purchasers of a product are not likely to have knowledge of inherent dangers or dangerous uses, the supplier may have to exercise a higher standard of care in providing warnings in order to avoid liability under negligence doctrines. Representative of cases indicating that a high degree of care may be required is J. C. Lewis Motor Company, Inc. v. Williams.93 In that case the plaintiff claimed injury as a result of inhaling carbon monoxide fumes

92 Prosser, Torts §34 at 161 (2d ed. 1955). Dean Prosser points out that in some states a violation of statute creates a presumption of negligence and in a few only evidence of negligence. Also violations of ordinances or regulations of administrative agencies may be treated only as evidence of negligence even in those states holding violations of statutes to be negligence per se.
emanating from a tractor purchased by her husband, but operated by her. The facts showed that the defendant supplier had failed to deliver a pipe which would have diverted the fumes away from the operator of the tractor. Furthermore, the plaintiff's husband knew of the omission since he contacted the supplier on several occasions, and the supplier promised to place an order for the missing pipe. The instructions supplied with the tractor contained no specific warning concerning the danger of carbon monoxide, but did state, that to avoid fumes, the pipe should be attached. The court held that the allegations were sufficient for the case to go to the jury for a determination of the questions of negligence of the supplier and possible contributory negligence on the part of the plaintiff. The plaintiff only had a fifth-grade education but the facts did not indicate the level of competence of her husband. It would seem that a knowledge of the danger of carbon monoxide would be almost universal among adults today; nonetheless, the court found that the jury should determine whether the supplier was negligent for failing to warn. The case illustrates the proposition that suppliers of radioactive materials and devices employing radiation must exercise extreme care in providing warnings, even though one might assume that any AEC licensee must know of the dangers involved.

h. Effect of Negligence by Others

Because of the complexities of our modern economic system, a number of problems arise in product liability cases concerning the effect of negligence that may be committed by others. Generally speaking, negligent acts committed by persons other than the defendant supplier in respect to the product may have one or both of two possible effects. First, a negligent act of another may insulate the supplier from liability, either because it proves that the supplier himself was not negligent, or that his negligence was not the "proximate cause" of the injury. Second, a negligent act of another may be the basis for shifting the economic loss suffered as a result of a judgment against the particular supplier for injuries sustained by the purchaser or third persons. The legal ramifications in respect to both of these possible effects are so complex, particularly because of the many possible factual variations, that we shall merely suggest the major considerations involved.

The possibility that negligence of another may serve to insulate a supplier from liability may be illustrated by a hypothetical atomic energy case. Suppose X markets a portable reactor power installation into which it incorporated a part negligently manufactured by Y, and the
defects cause a release of radioactive materials which results in bodily injury to A, the purchaser, who sues X. Can X avoid liability by showing that Y produced the part and that X used reasonable care in selecting Y as his supplier? A first consideration is the question whether X was separately negligent for his failure to inspect or in his manufacturing operations. In the MacPherson case, the defendant had purchased the defective part from another but the Buick Motor Company was not relieved from liability since it was found to be negligent in its inspection. Accordingly, it would appear that if the supplier has been negligent, he cannot successfully avoid liability to purchasers injured by the product he assembled. However, and to the contrary, in similar cases an assembler has avoided liability, apparently on the basis that the degree of care required of the assembler in inspecting the part is not as great as that imposed upon the manufacturer of the part. Professor James suggests that these cases do not follow the modern rule imposing liability on the person who represents the product as his own even though it is actually manufactured by others. To the extent that the cases deny liability where the product is represented by the seller as his own, they probably will afford little protection against liability of the seller in view of the more recent decisions. However, it would appear that they may have some validity where the part bears the trade-name of the actual manufacturer and the seller of the finished product is not equipped to make the same type of inspection as the manufacturer. For example, if, in our hypothetical portable reactor situation, the defective part was an electronic control mechanism for the reactor and if that mechanism bore the trade-name of Y after assembly of the reactor by X, it would seem that X may avoid liability if his selection of Y's product was reasonable and if he made reasonable inspections. The extent of the inspection required of X, of course, might be substantially less than that required of Y for it might not be readily possible to disassemble the device, and, furthermore, X may not be required to hold himself forth as an expert in electronic mechanisms. However, because of the dangerous qualities of reactors, the standard of care required of X would undoubtedly be higher than that encountered in respect to ordinary industrial products. In our survey of product liability cases, we have not

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94 Supra note 20.
95 See also Willey v. Fyrogas Co., 363 Mo. 406, 251 S.W.2d 635 (1952); Sullivan v. Manhattan Market Co., 251 Mass. 395, 146 N.E. 673 (1925).
97 James, supra note 18 at 192, 215. See cases cited therein at n. 142.
discovered any case defining the liability of the manufacturer where the defective part was a separate product assembled into the finished product with the original manufacturer's label attached. Therefore the possible effect of this fact upon liability remains conjectural.

It is clear, however, that the failure of any subsequent handler of the product to fulfill his duty to inspect will not prevent a prior handler who also had the duty to inspect from being held liable for his negligence. In *Willey v. Fyrogas Co.*, the plaintiff's husband was killed in attempting to light a gas heater because a defective valve caused an explosion. The manufacturer of the valve, the manufacturer of the finished product, the wholesaler, and the retailer were all joined as defendants. The valve manufacturer and the manufacturer of the finished product both argued that they were not liable because of the custom in the trade for the retailer to make further tests at the time of installation. The valve manufacturer further argued that the manufacturer of the gas heater made tests that should eliminate his liability. The court stated:

... The retailer's duty to test or his negligence in making tests certainly does not discharge the manufacturer's duty to also test and inspect and is not a defense to the manufacturer's negligence in constructing the article or in failing to properly test and inspect it. ... The failure of the vendee to properly inspect and test is within the foreseeable risk of the manufacturer.

The valve manufacturer, the gas-heater manufacturer, and the retailer were held jointly liable. The wholesaler was not held liable since he merely warehoused the heaters in their original crates until retail orders were received. Therefore, subsequent negligent acts by others in merchandising processes from the supplier of raw materials to the retailer will not immunize a prior handler or supplier from liability.

A more difficult question is whether negligence on the part of the purchaser or user of the product will permit the supplier to avoid liability for his negligence. In those states not following comparative negligence rules, it is generally recognized that contributory negligence and assumption of risk are defenses against liability even where negligence has been established on the part of the defendant. It is impossible for us to

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98 363 Mo. 406, 251 S.W.2d 635 (1952).
99 Id. at 421. See also Foley v. Pittsburgh-Des Moines Co., 363 Pa. 1, 68 A.2d 517 (1949), and Moran v. Pittsburgh-Des Moines Steel Co., 166 F.2d 908 (1948), discussed *infra*.
100 See Prosser, Torts c. 10 (2d ed. 1955).
consider the innumerable cases involving these defenses in negligence actions in this study, but it should be pointed out that in the product liability cases, Dean Prosser's statement that the courts are becoming more reluctant to find contributory negligence as a matter of law and that juries are "notoriously inclined" to enter verdicts for the plaintiff where there has been evidence of contributory negligence appears accurate. Representative of the possible obstacles to reliance on the defense of contributory negligence where radiation injuries are involved is the case of O'Connell v. Westinghouse X-ray Co., Inc. There the plaintiff, an experienced surgeon, claimed negligence on the part of the manufacturer of an X-ray machine for failure to explain the proper method of using the machine and for failure to provide a guard. The plaintiff, who did not witness the demonstration of the machine, thereafter used it during operations and suffered severe burning leading to the loss of three fingers. He also offered evidence that the condition was progressively deteriorating and that further amputations would be necessary. The jury returned a verdict against the manufacturer for $100,000 which was sustained by the trial court. On appeal, the Appellate Division found that the surgeon was contributorily negligent as a matter of law, stating:

It may be doubted that the truth is that plaintiff, a surgeon who had some experience with X-ray works, was ignorant of the fact that the nearer the hand is placed to the source of the X-ray beam, the greater the intensity of the beam falling upon the hand. But that is plaintiff's own claim, and it cannot be disregarded. If the purpose of the testimony is to lay the basis for a legal contention that a surgeon who works on bones under a fluoroscopic machine is not charged in law with knowledge of the factors determining intensity of effect upon the body, and that the surgeon is entitled to rest upon the same degree of ignorance as a layman, then it must be held that even a layman who attempts to set a fracture under a fluoroscopic machine without knowledge that intensity varies with distance is chargeable with contributory negligence as a matter of law.

101 Id. at 296.
102 See e.g., Pezzo v. Paterno, 277 App. Div. 496, 101 N.Y.S.2d 391 (1950), rev. 302 N.Y. 884, 100 N.E.2d 176 (1951), where the jury returned a verdict for the plaintiff, the Appellate Division of the Supreme Court reversed on the ground that there was contributory negligence as a matter of law, and the New York Court of Appeals reversed the Appellate Division stating that the submission of the issue of contributory negligence to the jury was proper.
104 16 N.Y.S.2d 54 (1939).
TORT LIABILITY

The evidence in plaintiff's case not only fails to establish his freedom from negligence, but establishes affirmatively as a matter of law that he was heedless of his own safety.\textsuperscript{105}

Despite the rather positive assertions of contributory negligence on the part of the surgeon by the Appellate Division, the Court of Appeals reversed, ordering a new trial.\textsuperscript{106} The difficulties involved for suppliers of devices that create radiation hazards are obvious. Even where knowledge of the danger may be assumed for persons in the same general class as the plaintiff, the supplier cannot escape liability if the plaintiff can show the absence of knowledge on his part and hence contributory negligence cannot be established.

The product liability cases where the plaintiff is a third person and there is evidence of negligence by the purchaser or user are even less susceptible to strict legal analysis. The problem is usually presented to the jury in terms of "proximate cause," but often this concept embraces the issue of duty and the standard of conduct.\textsuperscript{107} Again, in the product liability cases there is a marked tendency to find that the intervening negligence was foreseeable so that the supplier is not relieved from liability.

Consider the following hypothetical atomic energy fact situations:

1. \( A \) supplies a container for radioactive material which is defectively constructed so that even a slight impact will cause it to break. \( B \), in transporting cobalt \( 60 \) in the container, negligently drives the truck into a viaduct. \( C \), a bystander, suffers radiation injuries. Is \( A \) liable to \( C \)?

2. \( X \) supplies a reactor control mechanism which is defective. \( Y \), the reactor operator, negligently permits an increase in power level and the control mechanism fails causing a release of radiation injuring \( Z \). Is \( X \) liable to \( Z \)?

In both cases, it should be noted that the suppliers may be able to defend successfully against suits by \( B \) and \( Y \) if the court or jury find they are guilty of contributory negligence as a matter of law or fact. However, \( A \) and \( C \) may nonetheless recover from the suppliers for the intervening negligence.

\textsuperscript{105} 24 N.Y.S.2d at 270-271 (1940). Another issue involved was the nature of the negligence of the manufacturer in respect to the guard. The court pointed out that the omission of the guard was intentional since the purchaser wanted to keep down the price of his gift to the hospital of the machine. This fact situation alone, absent other allegations of negligence, raises the difficult question of what the supplier must provide from the standpoint of safety of radiation devices even though the purchaser does not want to pay the additional costs.

\textsuperscript{106} 288 N.Y. 486, 41 N.E.2d 177 (1942).

\textsuperscript{107} See Prosser, Torts c. 9 (2d ed. 1955).
negligence may be considered foreseeable so that a jury determination that $A$’s and $X$’s negligence was the “proximate cause” will be sustained. An example of cases involving a similar fact situation is *Benton v. Sloss.* In that case the defendant used-car dealer obtained a partial down payment for a car from a minor and permitted the minor to take possession. The minor’s father refused to sign the sales contract and told the minor to return the car. After two unsuccessful attempts to return it, the minor took the plaintiffs for a ride, and he raced with another car. When a car coming from the opposite direction suddenly appeared above a rise in the road, the minor tried to use the brakes, but only the right brake worked. The car was thrown off the highway into a telephone pole, thereby injuring the plaintiffs. They recovered judgments in the trial court against both the minor and the used-car dealer. In sustaining the judgment against the used-car dealer the Supreme Court of California stated:

... [The minor’s] negligent driving was unquestionably a cause of plaintiffs’ injuries. ... [The dealer’s] negligence was also a cause of those injuries, if it was a substantial factor in bringing them about. ... In the light of the evidence [the jury] could reasonably conclude that because of the defective brakes [the minor] could not avoid the collision. ... The negligent conduct of [the minor] did not relieve [the dealer] from liability, for the likelihood of negligent operation of the vehicle was one of the hazards that [the dealer] could reasonably foresee.

The conclusion to be drawn would seem to be that suppliers must accept the risk that the extent of the injuries resulting from their own negligence may be increased by subsequent negligent acts of the purchaser or user of the products. Intervening negligence is often found to be “foreseeable,” and the determination of the issue is left to the juries under the nebulous concept of “proximate cause.”

There remains for discussion the possibility that all or a part of the economic loss suffered as a result of a judgment against a product supplier may be shifted. The incidence of economic loss may be shifted by contractual arrangements or, absent express agreement, by the operation of certain legal factors. The former includes express agreements between the seller and the purchaser under which the purchaser of the product promises to reimburse the seller for any losses that he may suffer for damages based upon defects in the product. It would also include

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109 Id. at 405.
insurance. These pose no especially unique legal problems for atomic energy suppliers except that they may afford no real protection if the assets of the purchaser are insufficient to cover the liability or where the insurance coverage is limited in amount. However, atomic energy suppliers should explore these possibilities in conjunction with their sales. There is already some indication that "save harmless" clauses are becoming standard practice in the atomic energy field.

The possibility of shifting the economic loss suffered as a result of satisfying a judgment by seeking recovery of all or part of the moneys paid to the injured from other persons is more tenuous. If two or more suppliers of the same chattel, such as a part manufacturer, the assembler, the wholesaler, and the retailer, are held jointly liable for a breach of duty, such as the duty to inspect, in the same action, the plaintiff may seek satisfaction of his judgment from one or all. If the plaintiff collects the judgment from only one of the defendants, that defendant may seek contribution from the others who were held jointly liable. However, contribution is not generally available unless there is statutory authority. A discussion of the applicability of the statutes authorizing contribution in various fact situations is beyond the scope of this study, but the supplier who suffers the economic loss involved in a judgment should investigate the potentialities of having others share the loss.

Indemnity may also be available as a possible means of shifting the entire loss where negligent acts of others occur either prior or subsequent to the negligence of the person held liable to an injured person. The law concerning indemnity, however, is highly confusing, and for some inexplicable reason there is a paucity of cases dealing with attempts by suppliers to seek recoveries from others whose negligence may have caused the injury. The Restatement of the Law of Restitution contains the following:

Where a person has supplied to another a chattel which because of the supplier's negligence or other fault is dangerously defective for the use for which it is supplied and both have become liable in tort to a third person injured by such use, the supplier is under a duty to indemnify the other for expenditures properly made in discharge of the claim of the third person, if the other used or disposed of the chattel in reliance upon

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the supplier's care and if, as between the two, such reliance was justifiable.112

Most of the cases cited by the Reporters for this proposition, however, have dealt with the right to indemnity of the purchaser-owner from the supplier.113 Nonetheless, the principle involved should be equally applicable to indemnity by the retailer against the manufacturer, etc. In food product cases where under warranty doctrines a type of strict liability may be imposed against the retailer, indemnity has been allowed against the wholesaler and by the wholesaler against the packer.114 In two recent cases, manufacturer-assemblers have been unsuccessful in recovering from their suppliers for defective parts or materials, apparently on the ground that reliance on the prior supplier was not justifiable. In Heath v. Channel Lumber Co.115 the manufacturer of a ladder settled for $57,500 a claim for injuries sustained by a workman when the ladder broke. The manufacturer then sought indemnity for breach of warranty from the lumber supplier who supplied fir instead of hemlock as ordered by the manufacturer. The court refused indemnity on the ground that the plaintiff did not prove that the "efficient cause of the structural failure of the ladder was that one of its railings was fir and not hemlock without which circumstance the ladder would not have broken."116 Similarly in Maryland Casualty Co. v. Independent Metal Products Co.117 the plaintiff insurer, as subrogee of the manufacturer-assembler of the finished product, sought to recover the damages recovered by a third person on the theory that it was the defendant part supplier's negligence in manufacturing a tank for a truck trailer which caused the injury. The claim for indemnity was disallowed apparently because the insured Fruehauf Trailer Company actively supervised the supplier's work and because actual negligence could not be established although it seems that the injured person had no difficulty with this issue in the prior litigation.118

112 Restatement, Restitution §93(1) (1937).
113 See Seavey and Scott, Notes on Restatement of Restitution §93 (1937).
114 See e.g., McSpedon v. Kunz, 271 N.Y. 131, 2 N.E.2d 513 (1936); Hughes Provision Co. v. La Mear Poultry & Egg Co., 242 S.W.2d 285 (Mo. App. 1951). See also Annotation, "Recovery for loss of business resulting from resale of unwholesome food or beverages furnished by another." 17 A.L.R. 2d 1379 (1951).
116 95 A.2d at 429.
118 The difficulties in obtaining indemnity suggest that it may be advisable to have prior suppliers or subsequent vendees joined in the original action as defendants. In the Independent Metal Products Co. case, Fruehauf did tender the defense of the original action to the supplier, but he refused to accept. "Vouching in" practice should
remote possibility, but it exists and its possibilities should be explored by atomic energy suppliers in specific cases where there has been prior or subsequent negligence by other suppliers connected with the same chattel.

In summary, negligence by others may immunize product suppliers from liability, the most significant factor being, of course, contributory negligence on the part of the injured person. In addition, negligence by others, either prior or subsequent to the negligence of the product supplier, may offer the possibility of obtaining reimbursement of sums paid to satisfy claims of the injured. However, it appears that to date attempts to obtain reimbursement under indemnity theories have not been too effectual. For the product supplier to atomic energy industry, the most practicable approaches appear to be to obtain express agreements from purchasers or to purchase comprehensive insurance coverage.

i. Problems of Proof

In the atomic product liability field, as applied to atomic energy industry, some of the most unique problems are encountered in respect to the making of proof. As pointed out previously, the very nature of radiation injuries makes it difficult to prove causation in fact, and there are the innumerable unique problems of proof connected with cumulative injuries, intervening causes, and peculiar injuries, such as genetic damage and shortened life span. All of these will appear in product liability cases and solutions similar to those evolved for other negligence situations will undoubtedly be evolved by the courts. In product liability cases involving negligence doctrines the plaintiff must show that an injury occurred because of the condition of the product, that the condition was unreasonably dangerous, and that the condition resulted from the defendant's negligence. Each of these essential proof requirements may prove to be insurmountable obstacles to the plaintiff in atomic energy cases. In a highly scientific field it will frequently be extremely difficult for an injured person to prove that it was a defective product that caused a radiation injury. Possibly only the most exacting investigation would reveal the nature of a product defect that may have caused a reactor melt-down. Moreover, the accident may destroy the evidence of the defect. Even assuming that the injury may be traced to a defec-

be carefully scrutinized for its possible effects. For a recent case in which General Motors attempted unsuccessfully to have a retailer joined as defendant for its failure to inspect the brakes so that General Motors could avoid liability, see Birdsong et al. v. General Motors Corp., 99 F. Supp. 163 (1951).

110 See Chapter III, supra.

120 James, supra note 18 at 68-77.
tive product, the plaintiff may have difficulty in establishing the negligence of the supplier. Atomic science is undergoing almost daily change, and many theories are being subjected to complete reanalysis. Proof of reliance upon the best known existing methods may prevent the case from going to the jury because it may be impossible for the plaintiff to establish the precise nature of the standard of care which the defendant should have exercised in connection with the product. If the product or the processes in which the product is used are complex, proof of negligent acts will be especially difficult. Moreover, proof of governmental inspection and certification, which may often be available for atomic energy installations and particularly in respect to reactors, may be offered as proof of the exercise of reasonable care, and hence freedom of negligence on the part of the supplier. On the other hand, the doctrine of res ipsa loquitur may assist the plaintiff in establishing negligence on the part of a supplier. Although it is impossible in this study to explore fully the implications of the doctrine, a brief discussion of its use in a few cases will demonstrate its possibilities for assisting to establish negligence by suppliers of chattels.

In general discussions of res ipsa loquitur one of the stated requirements is that the defendant must have had exclusive control over the instrumentality causing the injury. Literal application of this requirement would prevent application of the doctrine in product liability cases involving suppliers once the product has passed into the hands of the purchaser or user. Although some courts have held that the doctrine was not applicable in such cases, the modern and more commonly accepted view is that exclusive control by the defendant at the time of the accident is not essential. Thus, in Gordon v. Astec Brewing Co. res ipsa loquitur was applied against the bottler of the beverage in a case in which the explosion of the bottle caused damage to the plaintiff notwithstanding the fact that intermediate handlers had been in control of the product after it had left the possession of the bottler. Moreover, the doctrine has been applied in product liability cases against multiple de-

121 For an interesting analysis of the possible liability of Cutter Laboratories for the recent polio vaccine deaths indicating that negligence probably cannot be established, see Note, "The Cutter Polio Vaccine Incident: A Case Study of Manufacturers' Liability Without Fault in Tort and Warranty," 65 Yale L.J. 262 (1955).
122 For a discussion of the possible effects of inspection and certification as a defense in the aircraft industry, see Hotchkiss, "Aircraft Manufacturers' Liability and the Civil Aeronautics Act of 1938," 16 Geo. Wash. L. Rev. 469 (1948).
123 See e.g., Kilgore v. Shepard Co., 52 R.I. 151, 158 Atl. 720 (1932).
125 See also Escola v. Coca Cola Bottling Co., 24 Cal.2d 453, 150 P.2d 436 (1944).
fendants. In *Nichols v. Nold* \(^{128}\) *res ipsa loquitur* was employed by the plaintiff who was injured by an exploding bottle to establish liability against the bottler, the distributor, and the retailer of a carbonated beverage. Furthermore, as in other negligence cases, the inference of negligence established by the doctrine is extremely difficult to refute. For example, in *Ortego v. Nehi Bottling Works* \(^{127}\) the defendant offered considerable evidence tending to prove that because of the extreme precautions taken there was no negligence on its part. Nonetheless, the inference of negligence based upon application of *res ipsa loquitur* was deemed sufficient to sustain the verdict against the bottler. The Louisiana Supreme Court, in commenting on this evidence, stated:

In fact [the defendants] are so strenuous in their arguments and the proof adduced to sustain the same that if it were not for the fact that the bottle in this case did actually explode without the touch of human hands, we would have no other recourse than to hold that the bottle did not in fact explode. \(^{128}\)

In addition, *res ipsa loquitur* has been employed against suppliers of chattels even where the product has been in use for an extended period by the purchaser. In *Ryan v. Zweck-Wollenberg Company* \(^{129}\) the plaintiff sought recovery from the retailer and the manufacturer of a refrigerator (Philco Corporation) for injuries suffered from electrical shock received when she placed one hand on the refrigerator and the other on a stove. The injuries were sustained in the spring of 1952, but the refrigerator had been purchased by the plaintiff’s daughter in the spring of 1949. Moreover, in the interim the purchaser had moved the refrigerator from one community to another. Nonetheless, *res ipsa loquitur* was held to be applicable, reliance being placed on the fact that the defect was in a “sealed unit.” The Wisconsin Supreme Court stated:

Because of the fact that the refrigerator in the instant case had passed out of the possession of the defendant manufacturer approximately three years prior to the accident, Philco maintains that the principle of *res ipsa loquitur* cannot be invoked in behalf of the plaintiff to establish Philco’s negligence inasmuch as the refrigerator was not within the exclusive control of Philco. If the refrigerator were a machine or appliance, such as an automobile or sewing machine, the moving parts of which are capable of being operated by the user, defendant’s point would be well taken. In case of injury resulting from the use of such a machine the inference would be


\(^{127}\) 199 La. 599, 6 S.2d 677 (1942).

\(^{129}\) Id. at 607.

\(^{129}\) 266 Wis. 630, 64 N.W.2d 226 (1954).
just as strong that the defect causing the injury occurred as the result of the operator's use as would the inference that the same was due to some defect in manufacture, and therefore the principle of res ipsa loquitur would not be applicable.

However, the operating mechanism of the refrigerator in question, consisting of the motor and compressor, was hermetically sealed within a metal inclosure and is commonly referred to as a "sealed unit." The evidence in the record shows that the sealed unit of the refrigerator causing plaintiff's injury was never opened or tampered with by anyone from the time the refrigerator was removed from its original shipping crate in which Philco had shipped the same, to the time of trial. There was nothing in connection with such sealed unit for the users of the refrigerator to operate. In the use of the refrigerator all that was done was to plug the electric cord of the refrigerator into one of the electric outlets forming part of the wiring system of the home. The testimony in the case definitely established that there was nothing in connection with the wiring of the refrigerator outside of the sealed unit which could have caused a short circuit. On the other hand, the evidence is undisputed that plaintiff did receive a severe electric shock as a result of a short circuit in the refrigerator. The inference, therefore, is almost inescapable that something inside of the sealed unit must have gone wrong to have caused such short circuit.\textsuperscript{130}

The conclusion to be adduced by atomic energy suppliers from the application of res ipsa loquitur in product liability cases is perhaps abundantly obvious. It apparently will be difficult to avoid application of the doctrine, particularly where the product may be described as "inherently dangerous." If the doctrine is applied, the plaintiff's burden in establishing negligence by the supplier is diminished considerably. In fact, it may even be argued that the application of res ipsa loquitur amounts in its effect to the imposition of strict liability in the particular case. Therefore, res ipsa loquitur may serve as a method of removing the substantial difficulties confronting a plaintiff who suffers radiation damage in proving negligence by suppliers of chattels.

\textit{j. Summary}

Throughout this discussion of liability of suppliers under general negligence doctrines two themes predominate so far as atomic energy

\textsuperscript{130} Id. at 639-640. See also Peterson v. Minnesota Power & Light Co., 207 Minn. 387, 291 N.W. 705 (1940). But compare Jastrzembski v. General Motors Corp., 100 F. Supp. 465 (1951), in which the court thought several months use of a car prevented application of res ipsa loquitur to injuries caused by a defect in an automobile transmission because it was subjected to outside forces, namely use or abuse by the owner.
suppliers are concerned. First, general negligence doctrines are available as a basis for imposing liability, especially where the product can be described as "inherently" or "imminently" dangerous, which will often, if not normally, be the case where radiation injuries are involved. Second, the unusual scope of potential liability in a reactor disaster situation creates serious risks for the supplier since a single accident may destroy his business assets unless the potential economic losses can be avoided by insurance coverage, by other legal devices, or through indemnification under the recent amendments of the Atomic Energy Act, discussed below. Conversely, for those suffering injuries as a result of defects in atomic energy products, it will be difficult to prove negligence by suppliers because of the uncertain and constantly changing state of scientific knowledge and because it will often be difficult to prove in fact that radiation caused a particular injury.

3. Warranties

a. Express and Implied Warranties

Although warranty is generally considered today to be based on contract theory, it was originally based upon tort, and it still retains many tort elements.\(^\text{181}\) For suppliers an important factor is that a breach of warranty results in the imposition of strict liability so that it is not necessary for the injured to prove negligence. Warranties may take one of two forms—either express or implied, and both are defined in most jurisdictions by legislative enactments of either the Uniform Sales Act or the Uniform Commercial Code.\(^\text{182}\) The Uniform Sales Act defines an express warranty as follows:

Any affirmation of fact or any promise by the seller relating to the goods is an express warranty if the natural tendency of such affirmation or promise is to induce the buyer to purchase the goods, and if the buyer purchases the goods relying thereon. No affirmation of the value of the goods, nor any statement purporting to be a statement of the seller's opinion only shall be construed as a warranty.\(^\text{183}\)

The Uniform Commercial Code contains substantially the same definition.\(^\text{184}\) What amounts to an express warranty in particular fact situa-

\(^\text{181}\) Williston, Sales §§105, 106 (Rev. ed. 1948).
\(^\text{182}\) The Uniform Sales Act has been adopted in 36 jurisdictions and the Uniform Commercial Code is now operative in Pennsylvania. The Commercial Code has also been adopted, although not yet operative, in Massachusetts and Kentucky.
\(^\text{183}\) Uniform Sales Act §12.
\(^\text{184}\) Uniform Commercial Code §2-313.
tions has been the subject of considerable litigation. In this study we cannot undertake a detailed analysis of the many problems involved in determining the existence of an express warranty. However, since express warranties may result in the imposition of strict liability, caution should be exercised by atomic energy suppliers during the negotiations for sales of products and in the drafting of sales agreements. In addition, atomic energy suppliers who wish to avoid liability on the basis of breach of express warranty should exercise care in the preparation of advertising circulars and literature. In some cases, the advertising representations have been characterized as warranties extending even to those not in privity with the advertiser. For example, in *Bahlman v. Hudson Motor Car Co.*, the defendant had issued advertising matter representing that its car had a seamless roof. The plaintiff claimed reliance on this statement in purchasing the car from a dealer. He claimed damages for head lacerations received when the car overturned; the injury being caused by jagged edges along a welded seam in the roof. The court held the car manufacturer liable, even though it was conceded that the purchaser was negligent in operating the car, on the ground that the "defendant's representations amounted to express warranties of quality and construction." Once express warranty was found, the court had no difficulty in dispensing with contributory negligence as a defense since warranty doctrines impose strict liability, the only question being whether the breach was the "proximate cause" of the injuries.

In contrast with express warranties, over which the seller has a large degree of control, warranties are often implied even though the seller has apparently attempted to avoid all warranties in respect to his product. Once again it is impossible for us to consider the many ramifications of implied warranties, but the statutory treatment is, of course, significant. The Uniform Sales Act provides:

Subject to the provisions of this act and of any statute in that behalf, there is no implied warranty or condition as to

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135 See 1 Williston, Sales c. VIII (Rev. ed. 1948).
138 Id. at 690.
139 See also Baxter v. Ford Motor Co., supra note 73, which may also be characterized as an express warranty case.
the quality or fitness for any particular purpose of goods supplied under a contract to sell or a sale, except as follows:

(1) Where the buyer, expressly or by implication, makes known to the seller the particular purpose for which the goods are required, and it appears that the buyer relies on the seller's skill or judgment (whether he be the grower or manufacturer or not), there is an implied warranty that the goods shall be reasonably fit for such purpose.

(2) Where the goods are bought by description from a seller who deals in goods of that description (whether he be the grower or manufacturer or not), there is an implied warranty that the goods shall be of merchantable quality.

(3) If the buyer has examined the goods, there is no implied warranty as regards defects which such examination ought to have revealed.

(4) In the case of a contract to sell or a sale of a specified article under its patent or other trade name, there is no implied warranty as to its fitness for any particular purpose.

(5) An implied warranty or condition as to the quality or fitness for a particular purpose may be annexed by the usage of trade.

(6) An express warranty or condition does not negative a warranty or condition implied under this act unless inconsistent therewith.\textsuperscript{141}

The Uniform Commercial Code has broadened the implied warranty provisions slightly, but the same general types of implied warranties remain.\textsuperscript{142} The possibility that implied warranties of fitness and merchantability under the statutes may expose atomic energy suppliers to strict liability is apparent. Furthermore, it can readily be understood from examination of the statutory language why the plaintiffs in product liability cases often plead both negligence and breach of warranty with the result that many cases are disposed of under warranty doctrines.\textsuperscript{143}

The availability of implied warranty theories to establish liability of suppliers of chattels, however, is limited by a number of technical requirements. By far the most drastic limitation is the requirement of

\textsuperscript{141} Uniform Sales Act §15.

\textsuperscript{142} Uniform Commercial Code §§2-314, 2-315.

\textsuperscript{143} A recent Georgia statute, Ga. Laws, 1957, Act 342, provides:

The manufacturer of any personal property sold as new property, either directly or through wholesale or retail dealers, or any other person, shall warrant the following to the ultimate consumer, who, however, must exercise caution when purchasing to detect defects, and, provided there is no express covenant of warranty and no agreement to the contrary:

1. The article sold is merchantable and reasonably suited to the use intended.

2. The manufacturer knows of no latent defects undisclosed.
“privity of contract.” Although we have seen that privity is no longer an essential element under negligence doctrines, implied warranty doctrine is not available to persons not parties to the contracts in a majority of jurisdictions. Moreover, there are a number of potential pitfalls even for those in privity, such as the requirement of notice to the seller within a reasonable time after the breach, the possible selection of an inadequate remedy, and the necessity of showing reliance on the seller.

However, in nearly one-third of the states the privity requirement has been abandoned in respect to food, drugs, and economic poisons. Thus, there appears to be a development in the law of implied warranty corresponding to that in negligence law in that the privity requirement is being relaxed where the product is “imminently dangerous.” A representative case is *Burr et al. v. Sherwin-Williams Co. of California.* There the plaintiff sought recovery for damage to his cotton crop sustained from spraying the crop with a chemical, supplied by the defendant, which apparently contained 2-4-D, a weedkiller. The plaintiff alleged both negligence and breach of implied warranty. The trial court, after reading the provisions of the Sales Act, gave the following instruction to the jury:

If you decide that any of the provisions of the code section . . . are applicable, and further decide that an implied warranty was made by the manufacturer, that warranty runs with the goods to the ultimate consumer, there being no requirement of privity of contract between the ultimate consumer and the manufacturer. And if you further find that the manufacturer breached such warranty, then it is liable for the damage caused by such breach, regardless of negligence.

The California District Court of Appeals, after holding that the doctrine of *res ipsa loquitur* was applicable in respect to the cause of action based on negligence, concluded that the trial court’s instruction was proper. Although the affirmation of the jury verdict was justified on grounds of negligence, the approval of the jury instruction on warranty indicates the willingness of the court to relax the requirements of privity when dealing with “imminently dangerous” articles.

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144 See James, *supra* note 18 at 192, 193-196, and cases cited therein.
145 For an excellent discussion of these requirements in relation to product liability, see James, *supra* note 18 at 196-205. Also see 1 Williston, Sales c. IX (Rev. ed. 1948); Prosser, “The Implied Warranty of Merchantable Quality,” 27 Minn. L. Rev. 117 (1943).
146 Prosser, Torts §84, p. 507 (2d ed. 1955).
148 258 P.2d at 64.
The Supreme Court of Kansas also has allowed recovery under implied warranty doctrines in the absence of privity. In *Graham v. Bot- tenfield's Inc.* the plaintiff was injured by a hair preparation which was purchased by the defendant distributor corporation from the manufacturer and was sold in the original container to a beautician who applied it to the plaintiff's hair. The plaintiff sought recovery for breach of an implied warranty of fitness. The defendant distributor defended on the grounds of no privity of contract and on the ground that it had no duty to test the product. The court, in holding that plaintiff could recover for breach of the implied warranty, discussed the food cases and stated:

If the reasons . . . for recognizing the exceptions to the general rule of the common law are to be followed and adhered to we are forced to agree there is merit in appellee's position that there is just as much reason for holding public policy, which it is to be noted is the basic foundation for the imposition of liability under the doctrine of implied warranty . . ., requires, that a manufacturer, jobber or distributor who sells [hair preparations] . . . impliedly warrants that preparation as suited and fit for use . . . as there is for holding that food manufactured and sold for domestic consumption is impliedly warranted as wholesome and fit for that purpose or that glass bottles when sold and/or delivered in connection with the sale of liquid beverages are impliedly warranted to be in a safe and nonexplosive condition. Therefore, on the basis of the reasoning of such decisions and what is there said and held, consistency requires and we feel constrained to hold the scope of the exception to the common law rule of *caveat emptor* . . . should be extended to include sales of the product here in question.

Despite the extensions of the implied warranty doctrine to cover those not in privity in the food, drug, economic poisons, and cosmetic cases, the courts have been reluctant to allow the use of implied warranty in connection with other products. For example, in *Wood v. General Electric Co.* where the plaintiff sought to recover damages for a fire

150 Id. at 74. See also DiVello v. Gardner Machine Co., 102 N.E.2d 289, 293 (Com Pleas Ohio, 1951): "...[T]his court is of the opinion that the sale of the grinding wheel carried with it an implied warranty of merchantability and fit for the usages designed and that such warranty extended to the workman of the vendee who was injured in its ordinary use because of a latent defect and in the absence of contributory negligence such workman could recover on the basis of a breach of warranty against the party who sold the wheel to his employer."
151 159 Ohio St. 273, 112 N.E.2d 8 (1953).
caused by a defect in an electric blanket manufactured by the defendant on both theories of negligence and breach of implied warranty, the Supreme Court of Ohio held that the implied warranty doctrine was not available, stating:

Although a subpurchaser of an inherently dangerous article may recover from its manufacturer for negligence, in making and furnishing of the article, causing harm to the subpurchaser or his property from a latent defect therein, no action may be maintained against such manufacturer by such subpurchaser for such harm, based upon implied warranty of fitness of the article so purchased. . . . Here, there was no such privity and hence no implied warranty upon the part of General Electric and no valid issue on that subject. 152

Nonetheless, the parallel history of recovery for negligence seems to indicate further extensions of implied warranty doctrines in the product liability field. For those atomic energy products that fall into the category of food, drugs, or economic poisons, such as radioactive materials that are to be used upon humans for medical tests or therapy, implied warranty will be available to those injured by a defect in the product. Other atomic energy products will escape strict liability on implied warranty theories until there are further extensions of existing rules of law. However, the high degree of danger involved in certain atomic energy products and the difficulties for the injured in proving negligence may provide the type of case in which courts initially may allow recovery for breach of implied warranty.

b. Effect of Disclaimers

Since liability under warranty doctrine arises either as a result of express contract provisions or is implied by law as a part of the contract of sale, it is generally recognized that by mutual consent the parties may exclude all warranties, both express and implied. 153 However, in some cases, such agreements have been denied effect on grounds of public policy. This is especially true in the food cases. 154 Moreover, the courts have been reluctant to find an exclusion of warranties unless the language of the sales agreement is absolutely clear. 155 Finally, the courts may

152 Id. at 279.
153 Both the Uniform Sales Act §71 and the Uniform Commercial Code §2-316 provide that agreements may be made to exclude all express or implied warranties.
155 See Note, 23 Minn. L. Rev. 784 (1939), and cases cited therein; James, "Assumption of Risk," 61 Yale L.J. 141, 162 et seq. (1952); James, supra note 18 at 192, 210-211.
find a disclaimer of warranties to be ineffective because the purchaser did not have proper notice of its existence, either because it was on the package, on an invoice, in small print, etc. Nonetheless, if care is exercised, atomic energy product manufacturers may make effective use of disclaimers to limit liability under warranty theories.

In addition to disclaiming warranties, the supplier may also, by mutual consent, disclaim any liability on his part under negligence doctrines if public policy does not render the contract provision void. For example, in Charles Lachman Co., Inc. v. Hercules Powder Co., Inc. the plaintiff sought recovery under negligence doctrines for damages caused to its carpets by use of a chemical manufactured by the defendant. The contract provided, in part: "Seller makes no warranty of any kind, express or implied, except that the materials sold hereunder shall be of Seller's standard quality, and Buyer assumes all risk and liability whatsoever resulting from the use of such materials, whether used singly or in combination with other substances." The court held that the contract provisions were sufficiently broad to preclude recovery under negligence theories, stating:

The general rule is that one party to a transaction may ordinarily contract to limit or eliminate his liability for negligence in performing his obligations. There is no rule of public policy which makes such provisions ineffective, particularly when the obligee is under no disadvantage by reason of confidential relationship, disability, inexperience or the necessities of the situation. In the present case the parties were both corporations engaged in large scale manufacturing. The plaintiff was under no compulsion to buy from the defendant and, if it desired to buy from it, had the choice of accepting the defendant's terms or going elsewhere.

The court's statement indicates that there may be limitations on contracting away liability for negligence where one party is in a disadvantageous bargaining position. Such has often been found to be the case where public utilities, common carriers, innkeepers, and public warehousemen have attempted to limit liability. However, for many

156 Note, supra note 155 at 795; 1 Corbin, Contracts §33 (1950).
158 See also Shafer v. Reo Motors, Inc., 205 F.2d 685 (1953), where the Lachman case is quoted with approval in holding a truck manufacturer not liable for negligence where the contract provided, in part, that "this Warranty being expressly in lieu of all other Warranties expressed or implied and of all other obligations or liabilities on our part, and we neither assume or authorize any other person to assume for us any liability in connection with the sale of our vehicles."
159 Supra note 157 at 207.
160 See Prosser, Torts §55, pp. 305-307 (2d ed. 1955), and cases cited therein.
atomic energy suppliers there appears to be no public policy that would render agreements to limit liability void.

However, disclaimers of warranty or liability for negligence will afford only limited protection to atomic energy suppliers in those instances in which a defect in the product leads to a major reactor mishap. The agreement between the supplier and his purchaser will have no effect on liability for negligence to persons not in privity. Even the broadest type of disclaimers of warranties and of liability for negligence will protect the supplier only from claims of injury to the purchaser and his property. They cannot be relied upon as a solution to the problem of the potential large-scale damages for which atomic energy suppliers may be held liable. They may, however, considerably reduce economic losses in those cases where the negligence caused minimal injuries to those not bound by the disclaimer. For example, if a defective control rod causes a reactor melt-down and if all radiation is contained within the building, the liability of the supplier who has the protection of disclaimers will be limited to satisfying the claims of persons irradiated within the building. It will not include the reactor loss. Therefore, the usefulness of disclaimers in the atomic energy industry should not be minimized, provided purchasers will accept the products on the specified terms and conditions.

4. Strict Liability
   a. Common Law

   It may be argued, and, we believe, quite effectively, that the extension of negligence concepts, the liberal use of *res ipsa loquitur*, the greater willingness to submit cases to juries, and the extension of implied warranty doctrines have carried us very close to the application of strict liability rules in the product liability field. However, with one possible exception, the courts have not as yet applied such rules against the product supplier, and the cases still are analyzed in terms of negligence, misrepresentation, or breach of warranty, even though a number of legal writers appear to urge the imposition of strict liability. The one possible exception is the case of *Chapman Chemical Co. v. Taylor* in which 2-4-D weedkiller sprayed from an airplane by a farmer drifted three-quarters of a mile and settled on the plaintiff's cotton crop. The defendant was the manufacturer. Testimony indicated that neither the

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181 See *e.g.*, James, *supra* note 18 at 192, 215; Ehrenzweig, Negligence Without Fault (1951).

182 215 Ark. 630, 222 S.W.2d 820 (1949).
manufacturer nor the user knew that 2-4-D had a propensity for floating much larger distances than experienced with other agricultural chemicals. Although the case may be analyzed in terms of negligence, the Arkansas Supreme Court, in holding the manufacturer liable, suggested that strict liability rules applied to the manufacturer by stating:

We do not think the Chemical Company excused itself from liability by the mere showing that it was unaware of the peculiar carrying quality of the dust it was selling. Ordinary care required that it should know in view of the dangerous nature of the product it was selling, and it was charged with the knowledge which tests would have revealed. The case is therefore one in which the rule of strict liability should be applied. 168

If other courts apply strict liability rules when dangerous products are involved, many atomic energy suppliers will be faced with potential liabilities that might not exist if only negligence concepts were applied. On the other hand, strict liability rules would assist injured persons in overcoming the difficulties of proving negligence in the highly technical atomic energy field. These difficulties may lead the courts to broaden the application of strict liability in atomic energy cases so that eventually liability in conjunction with any dangerous product may well be established under strict liability doctrines. 164

b. Under Statutes

Statutes may also be the basis of imposing strict liability in the product liability field or of imposing what amounts to strict liability by the use of presumptions. For example, in many states violation of the pure food and drug laws gives rise to a civil action for damages, and it is not necessary to allege and prove specific negligence or knowledge on the part of the maker or seller. 166 Under such circumstances the basis of liability may be characterized as strict. Also, violation of statutory restrictions is treated as negligence *per se* by some courts while others treat it as creating a presumption of negligence which must be rebutted by the defendant. Only a small minority of courts treat violations of statutes as mere evidence of negligence. 168 Thus, in most jurisdictions

168 *Id.* at 644. In Gotreaux v. Gary, 94 S.2d 293 (La. 1957), the Supreme Court of Louisiana held the user of 2-4-D liable for damages caused by the drifting of the weedkiller, applying a strict liability doctrine. The manufacturer was not a party to the litigation, however.

164 See Chapter IV for a discussion of the applicability of strict liability to atomic energy pursuits.

166 See generally, Prosser, Torts §61, p. 345 (2d ed. 1955).

168 *Id.* at §34.
statutory violations afford the plaintiff considerable assistance in proving negligence with the result that a type of strict liability may be said to exist in fact. Atomic energy suppliers, therefore, must carefully avoid violations of statutory standards that may be prescribed by the Congress or the state legislatures. Violation of regulations of administrative agencies in most states are apparently treated only as evidence of negligence, but in the atomic energy field the hazards are so unique that perhaps violations of rules of the Atomic Energy Commission or state health agencies may be held to be negligence \textit{per se}. Once again, the atomic energy supplier must exercise utmost care to avoid violations of regulations. The Atomic Energy Act of 1954 gives the Atomic Energy Commission broad rule-making powers to protect the public health and safety and many of the regulations promulgated by the Commission will apply to the activities of atomic energy suppliers.

5. Contractual Indemnification

Because of the magnitude of potential liability of atomic energy product suppliers, there are indications that the suppliers are requiring purchasers to execute sales contracts containing agreements to indemnify and hold the suppliers harmless from any possible liabilities. Such agreements, of course, will afford protection to the supplier only to the extent that the purchaser is able to bear the economic burden, either through insurance or otherwise. If the purchaser is unable to pay the claims of the injured, the supplier must respond in damages to the injured parties. If the federal government has agreed to indemnify the purchaser, the supplier is probably as adequately protected from economic loss as he can expect to be. Furthermore, under the recent governmental indemnity amendments to the Atomic Energy Act, the use of "save harmless" clauses will provide even greater protection to atomic energy suppliers. Therefore, atomic energy suppliers should examine thoroughly the possibilities of indemnity clauses in their sales contracts as a method of shifting the economic loss incurred through a nuclear accident, with the admonition, of course, that indemnity agreements will not insulate the supplier from loss if the purchaser is unable to pay.

6. Conclusion

We have sketched at length the several legal theories under which suppliers of atomic energy products may be held liable for injuries to third

\begin{footnotesize}
\footnote{167 \textit{Ibid.}}
\footnote{168 Atomic Energy Act of 1954, \S 161 (b).}
\end{footnotesize}
persons. We feel that it is abundantly clear that, even without further expansions of strict liability doctrines, there are several available legal avenues for imposing liability on atomic energy suppliers. In our society there is a definite trend toward the establishment of enterprise liability in conjunction with the sale of products in our economy. Undoubtedly the major compelling reason for this trend is the fact that the supplier is more likely, than is the injured person, to be able to suffer the economic losses or to take appropriate steps to minimize them. In respect to atomic energy products we can expect a continuation of the trend because of the unusual dangers involved. Therefore, atomic energy suppliers should adopt two courses of action: (1) initiate all necessary and reasonable procedures to assure that their products are incapable of becoming the cause of radiation injuries and (2) take all expedient legal steps either to avoid the imposition of liability or to shift possible economic losses by taking advantage of insurance and other contractual arrangements.

B. Liability of Building Contractors

Persons who design or construct fixtures and buildings expose themselves to liability for injuries to third persons at least during the construction period and possibly thereafter. In respect to atomic energy, the problems of liability during construction of an atomic energy facility are no different than those encountered in respect to any other building activity. Hence they will not be discussed herein. However, we are concerned with liability problems arising after the building contractor of an atomic energy facility has completed performance of his contract. Perhaps these problems can best be brought into focus through the use of hypothetical fact situations. Suppose X, a building contractor, builds a reactor building designed by A and supposed to be leakproof in case of a reactor mishap. If a reactor accident occurs and radioactive gases leak into the environment causing injuries to third persons, is X liable if he followed A’s design? Would X be liable if he knew that A’s design was improper? Would X be liable if during construction he made minor variations in the design? Would X be liable if the owner accepted knowing of the changes by X? Would X be liable to third persons if he warned the owner that the design was faulty or that the construction should be inspected periodically? It will be noted that these questions are substantially the same as those we have already considered in the product liability field. The major difference here is that we are dealing with a product which is likely to be large and stationary so that it is treated as real property rather than personalty.
The general rule in the United States appears to be that building contractors are not liable to third parties who may be injured as a result of the contractor's negligence after completion and acceptance of the construction by the owner.\footnote{For an extensive collection of the cases, see Annotation, "Negligence of building or construction contractor as ground of liability upon his part for injury or damage to third person occurring after completion and acceptance of the work," 13 A.L.R.2d 191 (1950).} Among the various reasons expounded by the courts for the rule are (1) lack of contractual privity between the parties, (2) the owner's intervening negligence as the proximate cause of the injury, (3) lack of foreseeability of injury by the contractor, (4) lack of control by the contractor over the design, and (5) lack of control after completion of the work which prevents the contractor from correcting the defects.\footnote{Ibid.}

It will be noted that most of these reasons no longer have any application in the product liability field although they were once employed to restrict the liability of manufacturers of chattels.

As in the case of the rule of non-liability for defects in chattels supplied by a party not in privity, exceptions have in recent years been made to the general rule in the case of contractors. Thus, where the completed work is turned over to the owner in a condition so negligently defective as to be imminently dangerous to third persons, recovery has been allowed.\footnote{Holmes v. T. M. Strider & Co., 186 Miss. 380, 189 So. 518 (1939), defective guard rail on bridge; Holland Furnace Company v. Nauracaj, 105 Ind. App. 574, 14 N.E.2d 339 (1938), negligent installation of furnace; Davey v. Turner, 55 Ga. App. 786, 191 S.E. 382 (1937), defective gas heater was installed and products of combustion escaping from a hose killed petitioner's daughter.} In \textit{Hale v. Depoali} the builder of a house was held liable for injuries sustained by the daughter of a tenant, when a railing which had been installed eighteen years previously gave way and the child was injured in a fall. An examination of the railing showed that nails too weak for safety had been used. The opinion referred to the doctrine of \textit{MacPherson v. Buick Motor Company} as supporting authority, despite the fact that that case concerned only a defective chattel. The court stated that the general rule was one of non-liability, and then proceeded to establish a significant exception, stating first, that when an article is such as to place life and limb in peril when negligently made, it then becomes a "thing of danger," and is subject to a rule of liability under the MacPherson doctrine; and, second, that when the article is of an abnormally dangerous and noxious nature, the rule against liability must give way, even in cases of defects in construction.
or design of structures on land. This has, indeed, great significance for atomic energy industry, because it may herald a blanket application of the rule of liability to third parties against the builders of atomic installations.

While it is commonplace to find general statements in nearly all of the opinions to the effect that the rule is still one of non-liability to third parties, even aside from the widening exceptions, some cases have boldly obliterated all distinctions between chattels and realty and have adopted identical rules of liability both for contractors and suppliers of chattels.

Two recent decisions are likely to figure prominently in cases dealing with the failure of nuclear energy structures and the liability of their constructors or designers. In 1944 a cylindrical tank, designed, constructed, and installed by the Pittsburgh-Des Moines Steel Company for the purpose of storing liquefied gas, exploded. Many persons were killed or injured and much property damage ensued. Over a hundred claims were filed against the defendant. Two test cases were tried, one in the federal and the other in the Pennsylvania state court. In each case the appellate courts expressly extended the doctrine of manufacturers liability to third parties to cases involving structures.

The federal decision, Moran v. Pittsburgh-Des Moines Steel Company,174 was the first one rendered. The plaintiff's decedent, Moran, was an employee of the East Ohio Company, an operating public utility engaged in selling natural gas for both industrial and consumer use in the City of Cleveland. To meet the problem of storing the gas so as to be able to meet the consumer demand, which fluctuated according to the seasons of the year, a plan was worked out whereby the gas was liquefied by subjecting it to temperatures 260° below zero F. The condensation in volume attained by liquefying the gas was so great that 600 cubic feet of natural gas became one cubic foot of liquid gas. The gas remained liquid as long as the temperature was kept at the extremely low level. To contain the liquid gas and to keep it at the low temperature required, steel tanks were placed within outer tanks with cork insulation between them, somewhat like the principle of a thermos bottle. The defendants built three of these tanks and experience with them proved satisfactory. Increased demand for gas led East Ohio to seek further storage space. The defendants contracted to build a new tank with twice the storage space of those first installed. The new tank was cylindrical in design (rather than spherical as the earlier tanks had been) and was completed and installed in May 1943. Thirteen months later it exploded.

174 166 F.2d 908 (1948).
The plaintiff presented two alternative theories of recovery. One called for application of the doctrine of strict liability under Ohio law. However, because the structure was not under the control of the defendant at the time of the explosion, the court held that the doctrine of strict liability was not applicable. The second theory was negligence, and the negligence alleged was that the defendants had installed a tank of improper design, made of inferior materials. Conflicting evidence on these subjects was adduced at the trial. The trial court refused to let the case go to the jury and entered an involuntary non-suit. In reversing this action of the trial court, Judge Goodrich, of the Circuit Court of Appeals, stated:

The second theory of responsibility which the plaintiff urges against the defendants is that the defendants were negligent in the plans for the structure and materials used therein. Before we outline the plaintiff's allegations with regard to negligence there is a legal question to be met. Assume, for the moment, that the plaintiff has alleged and shown negligence on the part of the defendants in planning and erecting the structure. Does their responsibility extend to harm suffered by one in the position of the plaintiff after the structure has been turned over to the purchaser, East Ohio? . . .

The old rule was that the manufacturer of a chattel was not responsible for injuries to others than his immediate vendee. Exceptions grew up to the rule and the whole matter received clarification by the New York Court of Appeals, through Judge Cardozo, in what is now the leading case of MacPherson v. Buick Motor Co. This decision puts responsibility for an injury to one operating the car on one who negligently manufactures a part of an automobile, and it is fair to call the decision a landmark in tort law. An examination of the Ohio authorities shows clearly, we think, that the principles upon which MacPherson v. Buick Motor Co. was decided are part of the law of Ohio. They are, likewise, generally, though not universally, accepted in modern law and are adopted in the Restatement of Torts.

Recognizing that the doctrine of MacPherson v. Buick Motor Company in itself was not enough to sustain the position of the plaintiff, the court went on to explain the development of that doctrine in Ohio:

We need to find that those courts have taken, or would take, one step more and possibly two. The first step is the manu-

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175 Although the case was tried in the Pennsylvania district the lex loci delicti was applicable.
176 Id. at 914-915.
facturer's or supplier's responsibility, not merely to the ultimate consumer of the article, but to a person in the vicinity of its use who is injured by the manufacturer's lack of due care. This extension of the MacPherson v. Buick Motor Co. doctrine is indicated in the Restatement and is clearly indicated to be the Ohio law in the decision of White Sewing Machine Co. v. Feisel. . . . We have no difficulty, therefore, in finding that the Ohio law imposes liability on a manufacturer, not alone to the ultimate consumer, but to one who might reasonably have been expected to be in the vicinity of the chattel's use.177

The second step to which the court alluded was whether or not the doctrine was applicable to cases concerning realty. On this subject Judge Goodrich continued with the statement that:

We have no doubt that an Ohio court confronted with the question would, in accordance with the development of the law shown in its previous decisions, extend the liability of the manufacturer to negligence involved in building a structure even though that structure was affixed on another's land.178

Thus the MacPherson doctrine was extended to impose liability for injuries to third parties other than the purchasers or ultimate users injured as a result of negligence in the construction of a structure usually denominated as realty under property law rules.

The companion case, Foley v. Pittsburgh-Des Moines Steel Co.,179 reached the same result by applying the same legal theories. There the trial court had permitted the case to go to the jury on the negligence issue, but when the jury returned a verdict for the plaintiff, the court granted the defendant's motion for judgment notwithstanding the verdict. The Pennsylvania Supreme Court reversed on the same principles as those applied by the federal court. In so doing the court stated that there was no logical basis for a distinction between chattels and realty "and it would obviously be absurd to hold that a manufacturer would be liable if negligent in building a small, readily movable tank which would undoubtedly be a chattel, but not in building an enormously large and correspondingly more potentially dangerous a one that legalistically was classified as realty." 180

The older rule of non-liability for injuries caused by structures seems to be uniformly followed in England. In a fairly recent case a builder

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177 Id. at 915-916.
178 Id. at 916
179 363 Pa. i (1949).
180 Id. at 34-35.
was held under no duty, either to a future purchaser or to persons who come to live in the house, to take care that it is well constructed and safe. In *Bottomley v. Bannister* 181 a boiler had been installed which was heated by a gas burner. No flue was provided to carry the gas outside, and the occupants, husband and wife, were killed by the poisonous gas. The court found negligence, but since the case involved the installation of a structure on realty, the court held the chattel cases inapplicable and recovery was denied. *Donoghue v. Stevenson*, 182 the English equivalent of the MacPherson case, raised certain doubts as to the validity of the non-liability rule in the case of building contractors, but a later case, *Otto v. Bolton and Norris*, 188 expressly differentiated between chattel suppliers and builders and held the old rule still to be in effect. Certain qualifications were made, however, in the *Otto* case, which although mere dicta may forecast a weakening of the rule of non-liability even in Britain. The court speculated on the result if the rule of liability as stated in the *Stevenson* case should be applied to a case of negligent construction of realty if the defect was not discoverable by the purchaser on a careful inspection. It was the opinion of the court that the *Stevenson* case opened the door to possible liability to third parties when no inspection by the occupant was to be expected or possible. This reasoning could expose the designers and builders of atomic energy installations in England to liability to third parties, if the defect in the construction or design is so hidden that reasonable inspection would not disclose it.

The similarity between the explosion of pressurized gas in steel tanks and the effect of loss of control of nuclear reactors is too clear to escape the notice of the courts in the United States if the issue of liability of a builder of atomic energy installations should ever arise. Even some of the language used in the opinion of the *Moran* case is suggestive of the likely results if a "burn up" of a nuclear reactor should occur. The court noted that the plant was a novel experiment and a "poignant episode in the development of the kind of bold and ingenious engineering for which Americans have become famous," 184 a comment which is particularly apropos in respect to nuclear reactors. Although technically the *Moran* and *Foley* cases could be limited in their future application, the logic of the cases is compelling and can be viewed as the culmination of the slow process of equalization between the cases of suppliers of chattels and those involving builders of structures on land.

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181 (1932) 1 K. B. 458.
182 (1932) A. C. 562.
183 (1936) 2 K. B. 46.
Therefore, these decisions may well represent the law to be applied to atomic energy enterprise with respect to the liability of designers and builders of nuclear installations. If this should be the future development of the law, designers and contractors for real property structures will be held liable under doctrines comparable to those now applied to suppliers of chattels with similar results.

C. Protection Afforded Supplier Under the Indemnification Provisions of the Atomic Energy Act

In 1957 the Atomic Energy Act was amended to place a limitation upon the total public liability of atomic energy entrepreneurs and to provide for governmental indemnification. These provisions, which were discussed in detail in Chapter III, are specifically designed to provide protection for suppliers of chattels, designers, and building contractors whose negligence may possibly result in a radiation accident. The significant provision is the definition of “person indemnified,” which reads:

The term “person indemnified” means the person with whom an indemnity agreement is executed and any other person who may be liable for public liability.

In its report, the Joint Committee on Atomic Energy indicated the applicability of the indemnification provisions to suppliers of chattels by stating:

The definition “person indemnified” means more than just the person with whom the indemnity agreement is executed. In the case of license this agreement will be executed with the licensee. Where the Commission and a contractor decide to take advantage of the provisions of this act, an indemnity agreement will be executed with the prime contractor. The phrase “person indemnified” also covers any other persons who may be liable. For a licensee for a reactor, this would mean in addition to the licensee that the indemnification extends to such persons as the subcontractors of the licensee, including those responsible for the design and construction of the reactor and the supplying of parts. However, it is not meant to be limited solely to those who may be found liable due to their contractual relationship with the licensee. In the hearings, the question of protecting the public was raised where some unusual incident, such as negligence in maintaining an airplane motor, should cause an airplane to crash into a reactor and thereby cause damage to the public. Under this bill the public is protected and the airplane company can also

take advantage of the indemnification and other proceedings. The proposed AEC limitation to those in privity with the licensee was reconsidered by the Commission, and the Commission decided to accept the premise of the original bills which would make the person indemnified any person who might be found liable, regardless of the contractual relation.188

The sweeping nature of the indemnification and limitation of liability provisions removes the major hazards of potential liability from suppliers of goods and services for atomic energy industry in that financial protection is required for reactor installations. However, in respect to certain licenses, namely those for domestic distribution of special nuclear material, source material, and byproduct material, the Commission does not have to require financial protection. If the financial protection is not required, an indemnification agreement by the Atomic Energy Commission is also not required. Therefore, suppliers of goods and services may not be protected under the federal legislation in respect to some radiation injuries. However, financial protection will probably always be imposed by the Commission as a condition of a license wherever the hazard is substantial. If the hazard is not unusual, the suppliers should be able to obtain satisfactory private insurance coverage or indemnification agreements from their customers. It should be noted, however, that the existence of federal indemnification may have the effect of broadening present liability concepts in the law and these concepts may be carried over eventually into other product liability cases not involving atomic energy activities.

Although the indemnification provisions of the Atomic Energy Act cover the major areas of liability which are of deep concern to atomic energy suppliers, three limitations in the effectiveness of the indemnification provisions warrant attention. First, the definition of “public liability” does not include liability for damage to property “at the site and used in connection with the activity where the nuclear incident occurs.” Since reactor installations are very costly, product suppliers will be faced with the potentialities of liability in tremendous sums if the purchaser can recover for property damage under theories of negligence, warranty, or strict liability. Therefore, suppliers should continue to obtain indemnity agreements from their purchasers wherever possible. The second limitation arises out of the definition of “nuclear incident” which is limited to “any occurrence within the United States.” If a supplier furnishes his products to purchasers for use in other

countries or upon the high seas, and injuries occur outside the United States for which the supplier may be held liable, the provisions of the Atomic Energy Act will afford no relief. Therefore, if atomic energy suppliers are engaged in sales of products to be used outside the United States, potential liability must be examined with reference to the laws of the foreign nations and the law of the high seas. A third limitation on the effectiveness of the indemnification provisions may arise whenever the scope of the financial protection required and obtainable through private insurance is less than the scope of possible public liability. Under the Atomic Energy Act the indemnification provisions do not operate unless the public liability is "in excess of the level of financial protection required of the licensee." Therefore, if the private insurance arrangements of the licensee have a shorter limitations period or if they do not provide coverage for certain types of injury, the supplier who may be liable under theories of strict liability, negligence, or warranty still faces the possibility of substantial liability.

Although these limitations on the protection afforded by the indemnification provisions may affect some suppliers in certain phases of their activities, generally the Atomic Energy Act of 1954, as amended, has created a favorable climate for suppliers to atomic energy industry. Unless some such indemnification were available, atomic energy suppliers would be forced to accept highly unusual monetary risks and entrance into the supply industry would be discouraged. As further studies are made in connection with foreign sales and activities, it is entirely possible that other governments will provide similar protection for atomic energy product manufacturers or an expansion of the indemnification provisions may be enacted by Congress. The Atomic Energy Commission and the Joint Committee are continually studying the problems and any severe legal restraints on the development of peacetime uses of atomic energy will undoubtedly be corrected.

187 Legislation providing indemnity protection for the proposed nuclear-powered merchant ship, the U.S. Savannah, has been approved by the Senate Committee on Interstate and Foreign Commerce, and has been transmitted to the Joint Committee on Atomic Energy for further study. S. 3106, 85th Cong., 2d Sess. (1958). Suppliers are expressly indemnified if the amendments recommended by the Maritime Commission are included in the proposed legislation. See BNA Atomic Industry Reporter 54: 17 (1958).

188 Section 170c, 42 U.S.C.A. §2210(c).