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THE RIGHT TO THE SUBJACENT SUPPORT OF OIL AND GAS

I

INTRODUCTION

During the last fifteen years property owners in the industrialized area overlying the Wilmington oil field in Los Angeles County, California, have suffered extensive property damage due to progressive land subsidence. This subsidence, which has necessitated remedial work costing an estimated fifty million dollars, is believed to be caused by the withdrawal of gas and oil from producing strata underlying the field. By August 1957, an elliptically shaped bowl-like area of approximately sixteen square miles had subsided from two feet on the periphery to a maximum of twenty-four feet near the center. This vertical displacement has had two effects: (1) it has lowered the land surface of a large area below the level of the adjacent San Pedro Bay, presenting a threat of inundation and necessitating the construction of dikes; and (2) it has caused the surface soil to displace laterally (up to nine feet), resulting in damage to surface and underground improvements.

Although the California codes contain two statutes which deal with land subsidence, neither appears to provide a private remedy for the subsidence damage in the Wilmington field. The first, Civil Code section 832, was enacted in 1872 to settle the rights between adjoining lot owners in cases involving surface improvements. This statute provides in part: “Each co-terminous owner is entitled to the lateral and subjacent support which his land receives from the adjoining land, subject to the right of the owner of the adjoining land to make proper and usual excavations on the same for the purposes of construction or improvement ...” (Emphasis added.) Under Civil Code section 659 land is defined as “the solid material of the earth, whatever may be the ingredients of which it is composed ....” (Emphasis added.) Thus, it appears that section 832 is inapplicable to any type of fluid support.

1 STEINBRUGGE & BUSHEL, SUBSIDENCE IN LONG BEACH-TERMINAL ISLAND-WILMINGTON, CALIFORNIA 6 (1958).
2 “[T]he three characteristics of the Wilmington oil field which seem to explain why oil withdrawal has resulted in the unusual subsidence are: 1. Whereas most of the oil reservoirs in California are strongly folded, with dips of up to 45 degrees on the flanks, making a strong arch, the Wilmington Field reservoirs are relatively flat, with dips of only 10 to 15 degrees on the flanks; 2. The reservoirs are relatively close to the surface of the earth, and instead of being overlain by thick layers of shale which occur in most oil fields, they are overlain by thin layers of shale and by gravel and sand; and 3. The Wilmington reservoirs are extremely thick, but at the same time are not well cemented or consolidated, so that when the reservoir pressures are reduced, there is a greater than usual volume of material subject to compaction.” Id. at 5.
3 At this time (August 1957) the rate of drop was 1.2 feet per year near the center of the bowl. Id. at 7.
The second statute, the Anti-Subsidence Act of 1958, was calculated to arrest or ameliorate subsidence by compelling oil producers in the Wilmington field to unitize and undertake repressurization activities. The legislature acted at the instigation of the City of Long Beach and upon expert advice that the subsidence could be checked by injecting water to repressure the oil bearing sands. The statute clearly reflects a desire to retain the economic benefits of the Wilmington oil production. This is indicated by provisions in the act which require "compulsory" unitization to be conditioned upon (1) a finding by the State Oil and Gas Supervisor that the cost of repressurization operations will be financed by increased oil and gas production resulting from such operations, and (2) the approval of operators entitled to sixty-five percent of the oil and gas produced within the proposed unit. The act does not, however, reflect a similar concern for the protection of private property rights in the event subsidence is not abated. It provides a cause of action for property damage only where such damage results from a direct violation of an order or decision of the State Oil and Gas Supervisor.

Consequently, if there is an effective remedy for property damage caused by the Wilmington subsidence it must be found in the common-law principles applicable to lateral and subjacent support.

Turning to the case law, it should be noted first that although oil subsidence has occurred in several locations, the Anglo-American courts have never been faced with the question of a surface owner's right to the subjacent support of oil and gas. Hence, the common-law principles applicable to this question must be...
found in subsidence cases involving the withdrawal of substances having similar physical and economic characteristics—namely, water, asphalt, and solid minerals. Unfortunately, these cases present two ostensibly conflicting lines of authority. On the one hand, the subsidence cases involving solid minerals, asphalt, and water containing sand or silt have consistently held that there is an absolute right to the subjacent support of soil in its natural state, although some courts have denied recovery for damage to artificial structures in the absence of negligence. On the other hand, in two leading cases, the courts have refused to impose liability for subsidence damage caused by the withdrawal of sand-free percolating water. Some text writers and the Restatement of Torts assert that these two cases carve out an exception to the common-law right to the subjacent support of unburdened soil. Thus the issues are formed: In developing principles applicable to subsidence caused by the withdrawal of oil and gas should the courts focus their attention upon the physical characteristics of fluids and find analogies in the sand-free percolating water cases, or should they draw analogies from the cases involving sandy water, asphalt, and solid minerals? Are the reasons which have compelled some courts to deny artificial structures the absolute right to the support of solid minerals applicable to cases involving gas and oil? And finally there are the ancillary issues: Who is entitled to support? Who is liable? How should damages be apportioned? With these questions as a guide, this Comment will analyze the development of the case law with a view toward evaluating the oil producer's liability for subsidence damage in the Wilmington field.

out of the shipyard only by means of reinforced concrete dikes. The Government asserts that a break in the dike, caused by earthquake or other means, could result in the death by drowning of many of the 6,500 employees of the shipyard, and the destruction of much property.

2. Damage caused by ground water: The subsidence has caused increasing amounts of ground water to percolate into structures of the shipyard. The Government asks damages for expenses incurred in providing additional drainage, pumping facilities, and weight to sink a large drydock.

3. Damage caused by unevenness of subsidence: This includes structural damage to buildings and facilities.

4. Cost of remedial action: This includes the cost of constructing facilities, the cost of raising waterfront facilities to workable levels, and the cost of raising installations in close support of the waterfront operations to higher levels so that the yard may be operated with its original efficiency.

The shipyard property was acquired by the Government in August 1940, and by 1943 most of the present facilities were completed. The deed contained a reservation excepting oil and other minerals underlying the land, so the Navy, as owner of the shipyard, did not share directly in the profits of the oil and gas production. Extraction of the oil and gas has been accomplished by slant-drilling under the Navy's property.


14 E.g., Trinidad Asphalt Co. v. Ambard, [1899] A.C. 594 (Trinidad).


II

WILMINGTON SUBSIDENCE COMPARED WITH ANALOGOUS COMMON-LAW SITUATIONS

Basically, two questions are presented: First, do the percolating water cases formulate principles which would except gas and oil from the common-law duty of subjacent support? Secondly, if such principles do not except oil and gas, should the common-law rule that soil in its natural state has an absolute right to subjacent support be applied in the fluid mineral cases?

In order to provide a background for the legal problems presented, the mechanics of fluid support will be treated briefly. The situations in which the land surface is partially or wholly supported by a fluid medium can be grouped into three categories: (1) fluid bulk support, (2) percolating water pressure support, and (3) oil and gas pressure support. In the first situation the soil derives its entire support from the fluid which is usually a muck or thick mixture of sand, silt and water (quicksand). The principal characteristic of fluid bulk support is that subsidence occurs when the fluid is withdrawn irrespective of a reduction in fluid pressure. Such subsidence occurs simply because the volume of fluid underlying a given area of land is reduced.

In the second situation, the soil is supported partially by solid material and partially by percolating water pressure. This represents the usual case where subsidence follows the withdrawal of ground water. Typically there is a stratum of sand overlain by soil containing one or more layers of impervious material, such as clay. If the sand stratum contains water, the weight of the overlying soil will be supported by two interdependent means: (1) the support afforded by compacted sand grains, and (2) the support afforded by water pressure acting against the lowermost layer of impervious material. If the water pressure is reduced, the compacted sand grains must bear a greater share of the weight of the overlying soil. This may cause further compaction of the sand grains with a resultant subsidence at the surface.

In the third situation, the soil is supported partially by solid material and partially by oil and gas pressure. This represents the condition existing in the Wilmington field. In such a case the fluids, including oil, gas, and connate water, were trapped securely within the underground strata during past geologic periods. The fluids do not have the migratory characteristics of percolating water unless the balance of nature is upset by a natural disturbance (such as an earthquake) or by the withdrawal of oil and gas. The reason for subsidence due to withdrawal is not settled. Some think it due, at least in part, to the dehydration of shale strata; others think it primarily due to pressure reduction with a consequent compaction or elastic deformation of the sandstone. In the latter case, the principle of pressure support is the same as that described above for percolating water. It is interesting to note that if the sand grains in the sandstone were cemented together so as to resist compaction, and deformed elastically with increased load, theoretically the land would return to its original level if the original reservoir pressure were re-established.

At the outset the distinction between private nuisance and the right to subjacent support should be noted. Although the essence of private nuisance is the unreasonable invasion of the peaceful use and enjoyment of land (FROSSLER, TORTS 405 (2d ed. 1955)), the common law carved out for special treatment certain rights in the use and enjoyment of land. These are called “natural rights.” They include riparian rights and rights to percolating water and land support. In contrast to the balancing process applied in nuisance cases, the courts have fashioned inflexible rules to protect these rights. See 3 TIFFANY, THE LAW OF REAL PROPERTY § 722 (3d ed. 1939) (riparian rights); CHASEMORE v. RICHARDS, 7 HOUSE OF L. 349, 11 ENG. REP. 140 (1859) (percolating water rights); CIUFERI v. BULLOCK MINING CO., 332 ILL. APP. 1, 73 N.E.2D 835 (1947) (right to land support). See also Woodward Iron Co. v. Mumpower, 248 Ala. 502, 28 So. 2d 625 (1946) (right to land support). But see 6–A AMERICAN LAW OF PROPERTY § 28.66 (Casner ed. 1954) (percolating water rights). The Restatement of Torts, chs. 39–41 (1938), noted this distinction by separately grouping private nuisance, rights applicable to the support of land, and rights applicable to the private use of water under the general classification of “Invasions of Interests in Land Other Than Trespass.” Compare 6–A AMERICAN LAW OF PROPERTY 135 (Casner ed. 1954) (right to support classified as private nuisance); 1 HARPER & JAMES, THE LAW OF TORTS 79 (1956) (states that the right to support is sometimes classified as private nuisance); SALTER, TORTS § 60a (12th ed. HEUSTON 1937) (right to support classified as private nuisance).
A. Percolating Water

Both the Restatement of Torts and text writers distinguish between subsid-ence caused by the withdrawal of “sand-free” percolating water, i.e., water which is substantially free of sand, silt or semi-fluid substances, and that caused by “sandy” percolating water. There are four reported “sand-free” percolating water cases. Of these, only two, Popplewell v. Hodkinson and New York Continental Jewell Filtration Co. v. Jones have ever suggested that the nature of the support afforded by clear fluids required the application of a unique doctrine. But the assertion that these two cases carve out an “exception” to the absolute common-law duty to provide subjacent support does not withstand analysis.

Before considering the Popplewell case it is important to reconstruct the background against which the case was decided in England in 1869. Acton v. Blundell in 1843 and Chasemore v. Richards in 1859 had firmly established the principle that a landowner had an absolute right to retain or divert sub-surface percolating water. On the other hand, Humphries v. Brodgen in 1850 had laid down the rule that land in its natural state had an absolute right to the subjacent support of underlying solid minerals. Moreover, it was also well established that such land had an absolute right to adjacent support.

In the Popplewell case, the plaintiff and the defendant’s employer owned adjoining lots. Plaintiff had constructed light dwellings on his lot. The defendant thereafter drained his employer’s land to prepare it for the construction of a church. This caused plaintiff’s soil (which the lower court described as “spongy”) to subside, causing damage to his dwellings. Although both the Acton and Humphries cases were urged upon the court, neither case was mentioned in the decision. Instead, the court simply stated that “although there is no doubt that a man has no right to withdraw from his neighbour the support of adjacent soil, there is nothing at common law to prevent his draining that soil, if, for any reason it becomes necessary or convenient for him to do so.” The court went on to emphasize that the plaintiff, in constructing the dwellings on his “spongy” soil, should have foreseen that the adjoining land would have to be drained if it were to be put to its best use. Although the court apparently assumed that the presence of the dwell-

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22 Restatement, Torts § 818, comment b (1939).
23 See 6-A American Law of Property 131-32 (Casner ed. 1954); 5 Powell, Real Property 289 n.31 (1956); 3 Tiffany, The Law of Real Property 189 (3d ed. 1939).
24 L.R. 4 Ex. 248 (1869).
30 The court noted, almost in passing, that Elliot v. North-Eastern Ry., 10 House of L. 333, 11 Eng. Rep. 1055 (1853), supported its view of the case. However, in the Elliot case the plaintiff sought to enjoin the removal of water which had washed into mine shafts underlying his land. The crux of the decision was the court’s opinion that the condition of the mine was due to an accident (the overflowing of a nearby river), and that plaintiff had no right to believe that the defendant mine owner could not at any time remove the water and resume working the mine in a manner that would not impair the plaintiff’s right to support.
31 L.R. 4 Ex. 248, 251-52 (1869).
32 The Popplewell decision adverted to the requirement of foreseeability by stating: “Indeed, when we remember that the land was close to an important and populous town, and that there was, therefore, every probability of its being built upon, the plaintiff, we may infer, must have had strong reasons for supposing that it would be so built upon, and, consequently, would be effectually drained, if the nature of the erections proposed to be put upon it should render that operation necessary.” Id. at 252.
ings was immaterial, the principle underlying this case is the one which is at the root of those cases which deny an absolute right of adjacent support to artificial structures—namely, that one cannot, through the use and improvement of his own land, increase his neighbor's duty of support or hinder him in making the best use of his land. Thus, it appears that *Popplewell*, rather than fashioning new principles with regard to percolating water, merely represents an application of settled principles governing the support of artificial structures.

The second "sand-free" water case, *New York Continental*, is the only one which suggests that the migratory nature of fluids requires the application of different principles to fluid support. In this case, the plaintiff alleged that his dwelling was damaged by subsidence caused by the drainage of subterranean water in the construction of a nearby tunnel. The court, holding for the defendant, cited *Popplewell* as the controlling authority. However, the court went on to state that the *Popplewell* rule stemmed from the common-law right to capture percolating water. The case is subject to question on both counts. First, the *Popplewell* decision emphasized that the plaintiff at the time of erecting his buildings should have foreseen the eventual need for draining the adjoining land. The facts in the *New York Continental* case did not indicate that the land was "spongy" or that the plaintiff was in any way put on notice that the adjoining land might require draining. Indeed, the court implied that the subsidence damage, if any, was caused by the weight of the plaintiff's house. Because of these factual distinctions, *Popplewell* should not have been regarded as controlling. The case is subject to question on the second count because the *Popplewell* case did not suggest that its decision was even remotely related to the rule of capture.

But even aside from the court's application and interpretation of *Popplewell*, the *New York Continental* case is subject to criticism on a more fundamental ground. The principal defect of the case is its failure to face the basic conflict between a landowner's right to take percolating water and his duty to provide subjacent support to the adjoining land. A rule which does not take these competing policies into consideration would seem to have limited value as a precedent.

The remaining two "sand-free" percolating water cases, *Langdoc v. Gevaert Co. of America* and *Russell, Inc. v. City of New York*, did not regard the fluidity of the supporting medium as a relevant factor. In the *Langdoc* case, the Massachusetts supreme court held that the defendant was not liable for taking water from his well, although he had caused the adjoining land to subside, damaging the plaintiff's house. The court applied the rule of the solid support cases and held that there was no liability for subsidence damage to structures unless negligence could be proved. The court cited a number of cases involving support by solids, but made no mention of either *Popplewell* or *New York Continental*.

The *Russell* case was decided in New York, a state which adheres to the reasonable use rule for percolating water. The court held that the owners of a large building had no cause of action for subsidence damage in the absence of (1) negligence or (2) proof that the damage was foreseeable. Again, neither the New

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34 315 Mass. 8, 51 N.E.2d 780 (1943).
36 This rule is similar to the correlative rights doctrine applied in California. Compare *O'Leary v. Herbert*, 5 Cal.2d 416, 55 P.2d 834 (1936), with *Forbell v. City of New York*, 164 N.Y. 522, 58 N.E. 644 (1900). See text accompanying note 59 infra.
York supreme court nor the court of appeals cited Popplewell or New York Continental.

In the numerous “sandy” water cases, the courts have consistently followed principles applicable to the support of solids and have held that there is an absolute duty of support. Where the courts have felt compelled to distinguish Popplewell they have done so on the ground that the landowner has no right to withdraw soil (referring to the sand and silt particles carried by the water) from under adjoining land. However, such a distinction is irrelevant because it does not controvert the fact that the subsidence was caused by the withdrawal of fluid support. The fact that the sand or silt particles could be removed by a relatively low fluid impact force would normally be prima facie evidence that the particles were not sufficiently compacted or consolidated to provide efficient solid support. Thus, in the absence of a valid distinction between “sand-free” water and “sandy” water, it would seem that these “sandy” water cases can be regarded as contrary to the Popplewell and New York Continental cases. Indeed, since the supporting medium is fluid in both situations, these cases simply cannot be reconciled.

Since the Popplewell case should be limited to the situation where the plaintiff can foresee and reasonably prevent future subsidence damage when he erects a structure, New York Continental is the only case left which lays down the rule that there is no right to the support of percolating water. And for reasons pointed out above, this case is tenuous authority at best. In light of the fact that the two other “sand-free” water cases and numerous “sandy” water cases have not regarded the fluidity of the support as a relevant factor, it seems fair to conclude that there is no percolating water “exception.”

B. Minerals

1. Unburdened Land

In England, Humphries v. Brogden laid down the rule that the owner of subjacent mineral strata is liable without fault for subsidence damage to land in its

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37 See note 15 supra.
38 Cabot v. Kingman, 166 Mass. 403, 44 N.E. 344 (1896); Jordeson v. Sutton, Southcoates & Drypool Gas Co., [1899] 2 Ch. 217. In Jordeson, Lindley, M.R., wrote: “It is unnecessary for me to decide whether, if the defendants had done nothing more than pump underground water from their own land and thereby let down the plaintiff's houses, an action could have been maintained against them. Popplewell v. Hodkinson looks like and has generally been regarded as an authority that no action will lie in such a case. But I am not satisfied that this broad question can be considered as finally settled by that or any other decision . . . . Two conflicting rights have to be reconciled—namely, the right to support and the right to pump water.” Id. at 239. In the same opinion Rigby, L.J., wrote: “[T]he mischief done to the houses must have been owing to a considerable extent to the act of the defendants in withdrawing soil in the form of silt from beneath the plaintiff's land . . . . [T]his cannot be included within any reasonable meaning of the word 'draining,' and for that reason the case cannot fall within the decision in Popplewell v. Hodkinson.” Id. at 242.
39 12 Q.B. 739, 116 Eng. Rep. 1048 (1850). To support the proposition that negligence is not an essential element of the cause of action, the court said: “We likewise think that the rule giving the right of support to the surface upon the minerals, in the absence of any express grant, reservation or covenant, must be laid down generally without reference to the nature of the strata, or the difficulty of propping up the surface, or the comparative value of the surface and the minerals. We are not aware of any principle upon which qualifications could be added to the rule; and the attempt to introduce them would lead to uncertainty and litigation; greater inconvenience cannot arise from this rule, in any case, than that which may be experienced where the surface belongs to one owner, and the minerals to another, who cannot take any portion of them without the consent of the owner of the surface. In such cases a hope of reciprocal advantage will bring about a compromise, advantageous to the parties and to the public.” Id. at 745, 116 Eng. Rep. at 1050.
natural state. This rule has been consistently applied to subjacent mineral (almost exclusively coal) support cases in the United States, except where the duty of support has been abolished by clear language in the grant or the reservation of the mineral estate. Since the percolating water cases cannot be said to have fashioned principles which, by analogy, would except gas and oil from the common-law right to subjacent support, the remaining question is whether the rule of the Humphries case ought to be applied to fluid minerals, such as oil and gas.

Oil is similar to coal in that both have a value apart from use with the land. But they are physically dissimilar in that (1) oil has the capability of migrating across boundary lines once production is started and (2) oil is believed to support the overburden primarily by pressure, as distinguished from the structural support given by coal. The first dissimilarity has forced the courts to fashion different rules to govern the ownership of minerals in a fluid state. For example, the removal of solid minerals from the property of another renders the taker liable for trespass, whereas the drainage of oil and gas does not per se create tort liability. Under the rule of capture, oil may be enticed across the lease boundary and into the well bore with impunity, as long as there is no waste. This rule is a justifiable one since it is simple to administer and by rewarding the diligent it encourages the development of petroleum reserves. But there is no reason for having a support doctrine different from that of the Humphries case just because of the dissimilarity between the pressure support given by fluids and the structural support given by solids. In either case, the party causing the damage to a particular area of land can be readily ascertained.

Probably the most forceful distinction between producing oil and mining coal is that the latter can be carried on without causing subsidence if proper care is taken to leave unmined pillars or artificial support, whereas it is not yet firmly established that repressurization will abate subsidence caused by the withdrawal of oil. However, the House of Lords had little difficulty with a similar problem

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41 One possible exception should be noted. In West Virginia it has been held that a grant of "the right to mine and ship all the coal" impliedly surrendered the right to support. A distinction is to be made between title to "all the coal" and that to "the right to mine all the coal." The first does not relieve the coal miner of the obligation to provide support for the surface; but the supreme court of West Virginia has construed the second to carry within it the right to remove all the coal. Simmers v. Star Coal & Coke Co., 113 W. Va. 309, 167 S.E. 737 (1933); Griffin v. Fairmont Coal Co., 59 W. Va. 480, 53 S.E. 24 (1905).

42 Gas may exist within the reservoir as a vapor, a liquid or a combination of both, depending upon the composition of the gas and the pressure and temperature to which it is subjected. But irrespective of the physical state in which gas exists, the pertinent fact is that it supports the overlying strata with the same pressure as the oil and has the same or a higher degree of mobility. Thus, no distinction need be made between oil and gas in analyzing the right to subjacent support.


44 This point has not been squarely decided in California because, as a practical matter, any action to enjoin waste will be brought under CAL. PUB. RESOURCES CODE § 3300-14 (unreasonable waste of gas declared unlawful). However, California cases brought to enjoin waste under these statutes contain language to the effect that the adjoining landowner has the right to prevent waste. See People v. Associated Oil Co., 211 Cal. 93, 103, 294 Pac. 717, 722 (1930); People v. Associated Oil Co., 212 Cal. 76, 80, 297 Pac. 536, 537 (1931); Bandini Petroleum Co. v. Superior Ct., 110 Cal. App. 123, 128-29, 293 Pac. 899, 901-02 (1930), aff'd, 284 U.S. 8 (1931).

45 See note 9 supra.
in the case of *Trinidad Asphalt Co. v. Ambard.* In that case the defendant was held liable for subsidence damage which resulted when he willfully drained asphalt (a semi-fluid hydrocarbon) from under the plaintiff's land. In response to the argument that asphalt could not be produced without subsidence and that the *Humphries* rule would damage an industry of great value to the community, the court said:

> Whatever the result may be, rights of property must be respected, even when they conflict or seem to conflict with the interests of the community. If private property is to be sacrificed for the benefit of the public, it must be done under the sanction of the legislature, which can and generally does provide compensation.

2. Land Burdened with Artificial Structures

It has been frequently stated that the owner of a subjacent solid mineral estate does not owe an absolute duty of support to artificial structures. This rule has normally been restricted to those instances where subsidence was caused by the added weight of the structure itself. In such cases, the courts have held that the right to support of land in its natural state is a right in the property itself, and does not extend to the artificial structures. Consequently, the only remedy for damage to structures due to subsidence is a personal action for negligence against the party who removed the support.

The principles here involved stem from cases involving the right to adjacent support (most of which are nonmineral cases). The rationale of these cases is that an adjoining owner cannot, through the use and improvement of his own land, increase the duty of support or hinder the use of adjoining property. However, in adapting the rule of adjacent support cases to those involving subjacent support, the courts have frequently failed to recognize a basic distinction. In the former, the landowner constructing a building can guard against future harm to his building either by placing it away from the boundary line or by providing a sufficient foundation, whereas in the case of subjacent mineral support the surface owner, even if he foresees the possibility of subsidence, can do little to prevent damage.

But even if the rule of adjacent support has been properly applied to subjacent

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46 [1899] A.C. 594 (Trinidad).
47 Id. at 602–03. Another argument for defendants, not presented in the *Trinidad* case, is that a landowner can provide artificial lateral support if he desires to excavate or mine solid minerals near the boundary, but if he wishes to take a fluid from under his land, it is impossible to provide artificial subjacent support. While the implication in this argument is that the landowner may thus be prevented from taking such fluids, in the final analysis it means only that he will be put to the expense of compensating his neighbor for subsidence damage when subjacent support is removed. This expense may or may not be greater than that of providing artificial lateral support if solids are removed.
51 The early case of Thurston v. Hancock, 12 Mass. 220, 7 Am. Dec. 57 (1815), laid down the rule that a landowner in constructing a building can and should consider the position of his neighbor's land and the possible uses to which it might be put.
52 Paris Purity Coal Co. v. Pendergrass, 193 Ark. 1031, 104 S.W.2d 455 (1937), recognized this distinction and imposed strict liability for damage to a building caused by the removal of the subjacent support of coal.
mineral support cases, it should not be applied to subsidence caused by the removal of oil and gas. In the Wilmington field, for example, the additional weight of the buildings could not cause subsidence, since the weight per unit area of even the heaviest structure is insignificant when compared with the weight of the 2,000 feet of rock and soil overlying the uppermost producing sand in the Wilmington area. Thus, it is difficult to see how the erection of a structure could increase the oil and gas producer's duty of subjacent support. Consequently, there seems to be no justification for denying an absolute duty of subjacent support to artificial structures when the supporting medium is gas or oil.

Where the land would have subsided irrespective of the additional weight of the structure, there are ostensibly two lines of cases. One line follows principles laid down in cases involving adjacent support and imposes strict liability for damage both to the buildings and the land. The other limits the remedy to an action for negligence against the party removing the supporting minerals. This second line of authority seems inapplicable to the Wilmington subsidence problem. Negligence cannot be proven where the subsidence is caused by oil and gas withdrawals unless it can be shown that (1) fluid injection for repressurization is a feasible method of preventing subsidence in the particular producing zone, and (2) that the defendant is not injecting fluid in a reasonable manner. Hence, to require negligence would restrict liability to those instances where it can be established that repressurization will abate the subsidence. Such a test, which would rely upon the vagaries of nature for a solution rather than upon the needs of the parties and the community, does not merit adoption. If strict liability is to be imposed for subsidence damage to land in the case of oil and gas withdrawals, logically it should also be imposed for damage to the artificial structures.

III

POTENTIAL PARTIES AND APPORTIONMENT OF DAMAGES

Where the plaintiff has no interest in the minerals withdrawn, he is clearly entitled to sue for subsidence damage to his land. More often than not, however,

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53 Nor does the oil producer have a sound theoretical basis for arguing that his burden of support has been increased. The only additional burden that might be thrust upon him by the weight of the structures is a remote possibility that if he is compelled to repressurize, the volume of injected water needed to repressurize the area will be increased because of the added weight. This, it should be emphasized, would happen only if elastic deformation had occurred, so that the ground level could be raised by repressurization. And even if additional settling did occur due to the weight of artificial structures, it might well increase the natural flow of oil into the well bore and hence compensate for any detriment the producer incurred in pressure maintenance operations.

54 See Annot., 32 A.L.R.2d 1309 (1953), cases collected in § 6.


56 In California, an action for injury to real property must be brought within three years. CAL. CODE CIV. PROC. § 338. Since the "easement" theory (under which the right to support is violated when the support is removed) is followed only in Pennsylvania, 6-A AMERICAN LAW OF PROPERTY § 28.48 (Casner ed. 1954), and has been expressly rejected in California, Sargent v. Jaegling, 83 Cal. App. 485, 256 Pac. 1116 (1927), it must be concluded that California will adhere to the conflicting "natural right" theory, which holds that the right to support pertains to the integrity of the supported land. But see Empire Star Mines Co. v. Butler, 62 Cal. App. 2d 466, 534, 145 P.2d 49, 82 (1944) (dictum indicating that California adheres to easement theory). Under the "natural right" theory, the right to support is a right in the supported land rather than in the adjacent or subjacent estate. RESTATEMENT, TORTS, Scope and Introductory Note § 817-21 (1939); 68 L.R.A. 673, 683, n.V. Consequently, the cause of action comes into exist-
the plaintiff will have a royalty or some other interest in these minerals and a duty, express or implied, to allow the owner of the mineral rights to make such use of the surface estate as is reasonably necessary to the enjoyment of his rights. This raises the question of whether possession of such interests and duties precludes recovery for subsidence damage. Inasmuch as the owners of soil overlying coal deposits have similar interests and duties, the answer to this question may be found in the coal subsidence cases.

The coal cases have uniformly held that in the absence of express language to the contrary, a conveyance of mineral rights does not constitute a surrender of the right to surface support. By analogy, if the plaintiff severs the fluid mineral estate from his fee in return for a lump sum payment, he should not be deemed to have surrendered his right to surface support. The fact that he has elected to receive payments measured by the amount of the minerals removed (a royalty interest) rather than a lump sum would not seem to decrease his right to support. However, in California, primarily because the ownership of oil and gas is lost once it crosses a property line, the grant or reservation of an interest in oil and gas can create no greater interest than a profit à prendre. But the fact that California courts have taken the migratory capacity of gas and oil into account for purposes of classifying legal interests should have no effect upon the grantor's right to support. The pertinent fact is that the courts have recognized that the right to support is separate from a grant of mineral rights.

Nor should the plaintiff be denied recovery for subsidence damage because of the oil producer's right to make reasonable use of the surface in conducting exploration and production operations. Coal lessees also have express and implied rights to enter and make reasonable use of the surface, and the courts have been careful to keep the coal lessee's right to reasonable access separate from his duty to provide subjacent support. There does not seem to be any reason why this distinction would not likewise be applicable to an oil and gas lease.

However, if the plaintiff retains a right of exploration and production in conjunction with the grantee, different considerations arise. He cannot be deemed to have granted away his right to surface support unless he so agreed, expressly or by implication. But if he either actively engages in the development program or acquiesces in it by sharing the profits and expenses, a court may find that he has impliedly relinquished his right to support.

The converse problem is whether a royalty interest holder should be held liable for subsidence caused by the withdrawal of oil and gas by the producer. Cases

ence only after the subsidence has actually occurred. See 6-A AMERICAN LAW OF PROPERTY § 28.48 (Casner ed. 1954). And where subsidence is recurring, each occurrence of damage gives rise to a new cause of action. Ibid. The practical effect of this is to permit an action to be brought for all damages occurring during the preceding period of limitations (three years) or since the last recovery, whichever is the shorter period.

67 1 WILLIAMS & MEYERS, OIL AND GAS LAW 190 n.2 (1959).
68 3 LINDLEY, MINES § 818 (3d ed. 1914).
69 See, e.g., Calahan v. Martin, 3 Cal. 2d 110, 43 P.2d 788 (1935). This is termed the "correlative rights" or "nonownership" theory and is followed in Alabama, Illinois, Indiana, Kentucky, Louisiana, New York, Ohio and Wyoming. See WILLIAMS & MEYERS, OIL AND GAS LAW § 203.1 (1959). Most of the oil producing states, however, follow an "ownership in place" theory, which gives the landowner a fee estate in the oil and gas. This estate is subject to divestment when the mineral is reduced to possession by another. Id. § 203.3.
70 3 LINDLEY, MINES § 813 (3d ed. 1914).
71 Compare 3 LINDLEY, MINES § 813 (3d ed. 1914), with 3 LINDLEY, MINES § 818 (3d ed. 1914).
involving solid minerals have consistently limited liability to the person who removed the support,\textsuperscript{62} except (1) where such person was a lessee and the lessor had actual control over the operations,\textsuperscript{63} or (2) where the lessor, who was receiving royalties from the mineral, knowingly permitted the lessee to remove subjacent support in violation of the lease.\textsuperscript{64} Thus, where the owner of a supporting estate removes the support and then sells the estate, liability follows the actor and does not attach to the new owner.\textsuperscript{65} It would seem that these principles should be applicable to oil and gas and that, in the usual case, the royalty interest holder should be free from liability for damage caused by subsidence.

The apportionment of damages between defendants presents a difficult factual problem where, as in the Wilmington field, there are a large number of oil producers who have contributed to the subsidence. It is not clear in California whether the plaintiff would have the burden of establishing a reasonable basis for apportionment, or whether a defendant—once he has been found liable—would have the burden of proving that others caused a proportionate share of the damage.\textsuperscript{66} It is clear, however, that once there is some evidence in the record to provide a basis for apportionment the trial court will be given a liberal hand in measuring the amount of damage caused by the defendant.\textsuperscript{67}

Any apportionment of the damage caused by the Wilmington subsidence must take into account the fact that the field is divided into six fault blocks by five major subsurface faults. These faults are believed to serve as underground barriers which prevent substantial fluid migration between fault blocks. As a consequence, it cannot be proved that a defendant who withdrew oil from one fault block contributed to the pressure reduction in another. Recognizing, however, that

\textsuperscript{62} Shenandoah Boro v. Philadelphia, 367 Pa. 180, 79 A.2d 433 (1951); Restatement, Torts § 820, comment g (1939).


\textsuperscript{64} Campbell v. Louisville Coal Mining Co., 39 Colo. 379, 89 Pac. 768 (1907).

\textsuperscript{65} Restatement, Torts § 820, comment g (1939).

\textsuperscript{66} In Slater v. Pacific American Oil Co., 212 Cal. 648, 300 Pac. 31 (1931), where defendant owned two of the thirty oil wells contributing to sump contents which were washed onto plaintiff's farm land, damages were not allowed because there was no evidence in the record to indicate the extent of the defendant's contribution to the injury. However, the decision quoted California Orange Co. v. Riverside Portland Cement Co., 50 Cal. App. 522, 195 Pac. 694 (1920) (defendant, owning one of several mills emitting dust which damaged plaintiff's orange orchard, held liable for proportionate share of damage) with approval, indicating that the court in the Slater case would have given the trial judge a liberal hand had there been evidence upon which to base an apportionment. Subsequently, the district courts of appeal have largely disregarded the Slater decision and have placed the burden on the defendant to show the extent of his contribution to the entire loss. See De Corsey v. Purex Corp., 92 Cal. App. 2d 669, 207 P.2d 616 (1949) (part of injuries caused by explosion of bottle due to internal pressure resulting from deterioration of contents); City of Oakland v. Pacific Gas & Elec. Co., 47 Cal. App. 2d 444, 118 P.2d 328 (1941) (part of damage to books caused by defendant's slowness in shutting off steam which escaped without its fault). But this trend was somewhat vitiated by the supreme court in Finnegan v. Royal Realty Co., 35 Cal. 2d 409, 218 P.2d 17 (1950), where part of plaintiff's burns could be attributed to defendant's failure to provide adequate fire exit doors. The court chose to interpret the damage as an "indivisible injury." Although the court adopted the rule that the burden was upon the defendant to show that it was responsible for only a part of the damage, it did so on the ground that where the injury is indivisible the law is loath to permit an innocent plaintiff to suffer as against a wrongdoing defendant. The court thus avoided a direct clash with the Slater case and left Slater, which is closely analogous to the oil subsidence problem, very much alive, but very much in doubt.

the producing strata and the 2,000 feet of overburden have a degree of rigidity, it is apparent that the fault blocks are structurally inter-related. Thus, the first factor to be considered is whether the subsidence (and the related lateral displacement) at the plaintiff's location would have been substantially the same had any one of the six blocks not been drained. If so, the producers in the noncontributing block should not be liable for the damage. As to the remaining fault blocks, the California courts could adopt either of two views. They could say that the damages should be apportioned first among the offending fault blocks according to the contribution of each to the total subsidence (a question that would be difficult to prove) and then among the individual producers within a particular block according to their proportionate share of the total fluid withdrawn from that block. This approach would tend to emphasize the fortuitous aspect of the producer's location with respect to the center of the subsidence bowl; i.e., producers who withdrew fluid from the blocks nearest the center of the bowl would be charged with most of the damage simply because those blocks, had they been left undrained, would have provided the most efficient support and subsidence on either side would have been minimized.

Second, the court could adopt the view that damages should be apportioned among the individual producers according to their proportionate share of the total fluid withdrawn from all the blocks that contributed to the subsidence. This is believed to be the better and more realistic approach. It, in effect, assumes that the subjacent support of the oil and gas was removed equally at all points in the field. It recognizes that subsidence is less at the edges of the field only because the edge receives support from adjacent strata. This approach can also be rationalized on the ground that compensation of surface owners for subsidence damage is a part of the cost of doing business and hence should, where there are several tortfeasors, be apportioned according to benefits received from the business.

CONCLUSION

A plaintiff in an action for damages caused by oil and gas subsidence would be faced with two obstacles to recovery: (1) the “principle,” noted by legal text writers and the Restatement of Torts, that there is no liability for subsidence caused by the withdrawal of percolating water; and (2) the numerous coal subsidence cases holding that there is no liability for damage to surface structures in the absence of negligence. The first obstacle does not appear to be a difficult one. The Popplewell and New York Continental cases, on the basis of their rationale, and in view of conflicting authority, do not appear to represent the present status of the subsidence case law with regard to percolating water.

The second obstacle likewise does not appear to be difficult to overcome. A distinction should be made between the mine owner who must provide a tangible amount of support for the surface, in the nature of coal columns or artificial support, and the oil producer who may be required to inject water into the producing measures to prevent subsidence. The courts have taken the view that the mine operator should maintain the surface in its natural state, but that the magnitude of his burden of support should not be increased by the construction of artificial structures. Since artificial structures are unlikely to increase the burden of support where the supporting medium is oil and gas, the reason for denying an absolute right of support to artificial structures does not apply where subsidence is caused by the withdrawal of oil and gas.
But the real solution lies in enlightened legislative action. The welfare of the community requires that the oil companies be permitted to continue operating in the Wilmington field. But, as in other cases where private property is damaged or taken in the public interest, an administrative procedure should be made available which is capable of speedily compensating the property owner for subsidence damage. There is ample precedent for such a procedure in the several coal mining laws which have been acted in England. Although these laws have taken different approaches to the problem, the underlying policy considerations in all are the same: (1) the recognition that production of the mineral is essential to the national welfare; and (2) the requirement that the consumers must bear the cost of producing the mineral. An amendment to the Anti-Subsidence Act to incorporate this concept would complete a matter which the California Legislature left unfinished in 1958.

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68 Coal-Mining (Subsidence) Act, 1957, 5 & 6 Eliz., c. 59; Coal-Mining (Subsidence) Act, 1950, 14 Geo. 6, c. 23 (repealed); Mines (Working Facilities and Support) Act, 1923, 13 & 14 Geo. 5, c. 20 (repealed). The broad sweep of Coal-Mining (Subsidence) Act, 1957, 5 & 6 Eliz., c. 59 is indicated by the following quotation from § 1: “Subject to the provisions of this Act, as soon as reasonably practicable after the occurrence of any subsidence damage the National Coal Board ... shall execute such works ... as may be necessary to render the damaged property reasonably fit for use for the purposes for which, at the date immediately before the damage occurred, it was or might in all the circumstances reasonably have been expected to be used .... [T]he Board may, instead of executing remedial works under the last foregoing subsection, elect ... to make a payment equal to the cost reasonably incurred by any other person in executing remedial works ....”

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