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SUPREME COURT OF THE UNITED STATES

Syllabus

LOUISIANA *v.* MISSISSIPPI ET AL.

ON EXCEPTIONS TO REPORT OF SPECIAL MASTER

No. 86, Orig. Argued January 16, 1984—Decided April 2, 1984

This original action was filed by Louisiana against Mississippi and a riparian landowner (Dille) to resolve a dispute as to the boundary between the two States in a reach of the Mississippi River. In 1970, Louisiana, acting in its capacity under Louisiana law as the owner of the riverbed out to the boundary line, executed an oil and gas lease covering the disputed area. In 1971, Dille, as the owner of riparian land in Mississippi who, under Mississippi law, has title to the riverbed out to the boundary line, executed a similar lease to the same lessee,* who drilled a well directionally under the river from a surface location on Dille's land on the Mississippi side. The location of the "bottom hole" of the well—which was completed in 1972 and has been producing continuously since then—is known and agreed upon. After trial, the Special Master filed a Report, concluding that at all times during the disputed period of 1972–1982 the well's bottom hole was within Louisiana, west of wherever the boundary might have been, and that it was not necessary to delineate the specific boundary during the relevant years. Mississippi filed exceptions to the Report.

Held:

1. At all times since the completion of the well in 1972 its bottom hole has been within Louisiana. Pp. 3–10.

(a) Earlier original-jurisdiction litigation between Louisiana and Mississippi in this Court has established that the "live thalweg" of the navigable channel of the Mississippi River is the boundary between the two States. A boundary defined as the live thalweg follows the course of the stream as its bed and channel change with the gradual processes of erosion and accretion. The ordinary course of vessel traffic on the river defines the thalweg. Pp. 3–5.

(b) The Court agrees with the Special Master's conclusion, which is consistent with the testimony of Louisiana's two expert witnesses, that

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the live thalweg was to the east of the well's bottom hole location for each of the years in question, thus leaving the well within Louisiana throughout the disputed period, and with his rejection of the view of Mississippi's expert witness that the boundary line migrated so as to shift the jurisdictional location of the well back and forth between the States during the relevant years. This conclusion resolves the case so far as the Louisiana and Dille leases, and the consequences that flow therefrom, are concerned. Pp. 5-10.

2. The Master properly concluded that the only issue to be resolved centered on the location of the well's bottom hole and that it was not necessary to delineate the specific boundary in the area for each of the 11 years from 1972 to 1982. Pp. 10-12.

Exceptions to Special Master's Report overruled and Report confirmed.

BLACKMUN, J., delivered the opinion for a unanimous Court.

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SUPREME COURT OF THE UNITED STATES

No. 86 Orig.

STATE OF LOUISIANA *v.* STATE OF MISSISSIPPI ET AL.

ON EXCEPTIONS TO REPORT OF SPECIAL MASTER

[April 2, 1984]

JUSTICE BLACKMUN delivered the opinion for the Court.

This original action was filed by the State of Louisiana against the State of Mississippi and Avery B. Dille, Jr., to resolve a dispute as to the boundary between the two States in a reach of the Mississippi River above the Giles Bend Cut-off, upstream from the city of Natchez. The Report of the Special Master, however, stops short of ascertaining the entire boundary along this stretch, for the Master would have us resolve the case in Louisiana's favor with the conclusion that throughout the period 1972–1982, the years relevant to this litigation, the actually contested point—the place in the riverbed of the “bottom hole” of a particular producing oil well—at all times was west of wherever that boundary line might have been and was within the State of Louisiana. Therefore, the Special Master observes, we need go no further in bringing this controversy to an end.

Mississippi has filed exceptions to the Special Master's Report, Louisiana has filed its response to those exceptions, the case has been argued orally, and the matter, thus, is before us for disposition.

I

In the area in question, the Mississippi River marks the boundary between Mississippi and Louisiana. See Act of Apr. 8, 1812, 2 Stat. 701, admitting Louisiana to the Union; Act of Mar. 1, 1817, 3 Stat. 348, and Joint Resolution of Dec.

10, 1817, 3 Stat. 472, admitting Mississippi to the Union. Under Mississippi law, an owner of land riparian to the Mississippi River has title to the riverbed out to the Louisiana line. *Morgan v. Reading*, 11 Miss. 366 (1844); *The Magnolia v. Marshall*, 39 Miss. 109 (1860); *Wineman v. Withers*, 143 Miss. 537, 547, 108 So. 708 (1926). Under Louisiana law, however, the State owns the riverbed out to the Mississippi line. *State v. Capdeville*, 146 La. 94, 106, 83 So. 421, 425 (1919); *Wemple v. Eastham*, 150 La. 247, 251, 90 So. 637, 638 (1922).

In July 1970, Louisiana, acting in its proprietary capacity, executed an oil and gas lease covering the area of the riverbed now in dispute. In January 1971, defendant Dille executed a similar lease. Each lease ran to the same operator. The lessee drilled a well directionally under the river from a surface location on riparian land owned by Dille on the Mississippi side. The well was completed in January 1972. Its bottom-hole location is known and agreed upon. See Tr. of Oral Arg. 25-26. It has been producing continuously since its completion. Mississippi acknowledges that when the well was completed and production began, the bottom hole was in Louisiana. Mississippi Exceptions 2.

On June 20, 1979, Dille instituted suit in the Chancery Court of Adams County, Miss., against Louisiana and certain individuals and entities then holding working interests in the leasehold estates under the Dille and Louisiana leases. Dille, as plaintiff, alleged that the boundary between the States had migrated westerly so that the bottom hole of the well was within Mississippi and thus subject to the Dille lease. The defendants in that action removed it to the United States District Court for the Southern District of Mississippi. It remains pending in that court (Civil Docket No. W79-0069(R) *sub nom. Dille v. Pruet & Hughes Co. (a partnership), et al.*).

Louisiana, on December 21, 1979, filed a motion with this Court for leave to file a bill of complaint against Mississippi

and Dille. Although Mississippi opposed the motion, we granted leave to file. 445 U. S. 957 (1980). The Federal District Court in Mississippi, on the joint motion of the parties to the removed action, then stayed the proceedings before it pending resolution of this original-jurisdiction suit. Meanwhile, the defendants here filed their answer. We appointed Charles J. Meyers of Denver, Colo., as Special Master. 454 U. S. 937 (1981).

The Master proceeded with a pretrial conference and a schedule for discovery. A motion to intervene, filed by individuals and corporations asserting mineral interests in the Louisiana lease, was denied by the Master. By the same order, the Master specified that the proper issue for this Court to resolve was the location of the Louisiana-Mississippi boundary relative to the bottom-hole location of the oil well. On that basis, the case went to trial before the Master in New Orleans on September 20, 1982.

II

The bed of the Mississippi River between Louisiana and Mississippi has been the subject of other original-jurisdiction litigation here. See *Louisiana v. Mississippi*, 202 U. S. 1 (1906); *Louisiana v. Mississippi*, 282 U. S. 458 (1931); *Louisiana v. Mississippi*, 384 U. S. 24 (1966). In all three of those cases, this Court ruled that the “live thalweg” of the navigable channel of the Mississippi River was the boundary between the two States. 202 U. S., at 53; 282 U. S., at 459, 465, 467; 384 U. S., at 24, 25, 26. That issue must be regarded as settled. See Tr. of Oral Arg. 4. It forms the predicate, of course, for the present litigation.

The Giles Bend Cutoff, north of Natchez, was constructed in the 1930's. It captured the main flow of the Mississippi River, which then abandoned an old westerly bend that had marked its principal course. The cutoff, being man-made and effectuating a channel change, obviously, was avulsive; there is, however, no question here as to the state boundary

in the latitude of the cutoff itself. We are concerned with the area just upstream from the cutoff.

The proposition, stated above, that the live thalweg of the navigable channel of the Mississippi River is the boundary between Louisiana and Mississippi in itself affords little help in this case and does not take us very far. Indeed, the parties do not dispute the applicable general legal principles. Mississippi itself observes that there is "no serious disagreement . . . as to the law of the case." Mississippi's Exceptions 4. See Reply Brief for Louisiana 5.

A boundary defined as the live thalweg usually will be dynamic in that it follows the course of the stream as its bed and channel change with the gradual processes of erosion and accretion. *Arkansas v. Tennessee*, 246 U. S. 158, 173 (1918); *Arkansas v. Tennessee*, 397 U. S. 88, 89-90 (1970). In contrast, however, the boundary may become fixed when, by avulsive action, the stream suddenly leaves its old bed and forms a new one. *Arkansas v. Tennessee*, 246 U. S., at 173, 175; *Arkansas v. Tennessee*, 397 U. S., at 89-90. Thus, merely to say that the live thalweg is the boundary does not lead us here to an easy conclusion, for, as Mississippi argues, that thalweg may wander, and, if it wanders far enough, the bottom hole of this particular well may find itself at different times on opposite sides of the state line.

The matter is further complicated by the fact that the definition of the term "thalweg" has not been uniform or exact. The Master notes in his Report, p. 4, that this Court, in *Louisiana v. Mississippi*, 202 U. S., at 49, observed that the term has been defined to mean "the middle or deepest or most navigable channel," but he points out correctly that "the middle" or the "deepest" or the "most navigable" are not necessarily one and the same. Indeed, this Court itself acknowledged this fact in *Minnesota v. Wisconsin*, 252 U. S. 273, 282 (1920) ("Deepest water and the principal navigable channel are not necessarily the same"). The doctrine of the thalweg has evolved from the presumed intent of Congress in

establishing state boundaries, and has roots in international law and in the concept of equality of access. *Iowa v. Illinois*, 147 U. S. 1 (1893). See *Texas v. Louisiana*, 410 U. S. 702, 709–710 (1973).

What emerges from the cases, however, is the proposition that the live thalweg is at “the middle of the principal [channel], or, rather, the one usually followed.” *Iowa v. Illinois*, 147 U. S., at 13; *Minnesota v. Wisconsin*, 252 U. S., at 282. See *New Jersey v. Delaware*, 291 U. S. 361, 379 (1934). As the Master observed, and as the parties appear to agree, “the thalweg defines the boundary, and the ordinary course of traffic on the river defines the thalweg.” Report, at 6. Our task, therefore, is to identify the downstream course of river traffic. It appears to us, as it did to the Master, to be a matter of evidence as to the course commonly taken downstream by vessels navigating the particular reach of the river. It is to the evidence that we now turn.

III

Three witnesses testified before the Master and did so at length. Each qualified as an expert. Two, Hatley N. Harrison, Jr., and Leo Odom, were presented by Louisiana. The third, Austin B. Smith, was presented by Mississippi. Each is a trained engineer who has spent much of his professional career attending to problems related to the surveying and mapping of rivers, river navigation, and flood control. The Master concluded that, despite questions raised by Mississippi as to the witnesses’ relative qualifications, each had “professional qualifications needed to identify, interpret, and evaluate data relevant to the problem of locating the live thalweg in the disputed reach of the river” and that each “did a commendable job.” *Id.*, at 7. We carefully have reviewed their testimony before the Master, and we have no reason to disagree with the Master’s evaluation of their respective qualifications or with his observation as to the commendableness of their performances as witnesses.

Over 100 exhibits were admitted in evidence in conjunction with the testimony of the three experts. In particular, hydrographic surveys for each of the years 1972–1982 were admitted; these were prepared by the United States Army Corps of Engineers. The surveys contained data as to soundings, average low water plane, contour lines, and gauge data. They noted the location of lights placed by the Coast Guard as an aid to navigation. Some also noted the location of buoys and floats that served to indicate the direction and relative velocity of the current. Louisiana introduced channel reports issued by the Coast Guard during the years 1976–1982; these were based on soundings and recommended a course by reference to lights and buoys.

The Master observed, *id.*, at 10, that the hydrographic surveys provided the general characteristics of the disputed reach of the river. The area is approximately four miles long. Its general shape is an elbow-like bend with the concave bank on the Mississippi side. The bottom-hole location of the well is approximately one mile downstream from the point of the bend. The Gibson Light is about two and one-half miles upstream from that point. An uninterrupted trough of deep water never has been present in the disputed area. A trough of deep water, however, generally lies along the Louisiana bank, upstream from the point of the bend. Another trough lies along the Mississippi bank downstream from the point of the elbow. The riverbed, however, “rises markedly between the two troughs of deep water,” *id.*, at 11, and during each of the years in question downstream traffic has had to traverse a “crossing” of shallower water between the troughs. It is as to the navigation of this crossing that the expert witnesses disagreed.

The sailing line or live thalweg placed on the hydrographic surveys by Louisiana’s witness Harrison passed to the east of the bottom-hole location of the well for each of the years 1972–1982; it thus left the well within the State of Louisiana throughout that period.

Louisiana's other witness, Odom, took a somewhat different approach. He offered as the preferred sailing line, or live thalweg, a channel depicted on a particular map transposed onto the hydrographic surveys. His line and Harrison's line do not coincide. Odom's version, however, as did Harrison's, had the transposed channel line always well to the east of the bottom-hole location of the well. In other words, under witness Odom's version, too, the bottom hole always was west of the boundary and within Louisiana.

Mississippi's witness Smith followed another path. He stressed three factors: the downstream course, the track of navigation, and the thalweg. The first two, he indicated, are closely related and perhaps identical. The track of navigation can be established from navigational aids, such as lights and bulletins to mariners. The thalweg, however, is the line of deepest and swiftest water. It could be determined by the sounding and contour lines on the hydrographic surveys. Witness Smith did not explicitly use the navigational aids to determine the track of navigation. Instead, he determined the live course according to the thalweg evidence on the surveys. Thus, his method was to place the boundary along the line of deepest and swiftest water that he was able to discern from the soundings and contour lines. He applied this method to all reaches of the stream including the crossing.

Smith's approach placed the boundary line to the east of the bottom hole during the years 1972-1974. He, however, had the boundary line meander west so that it passed over the bottom hole on January 11, 1975. He had it then move east so that it passed over the bottom hole in that direction on December 20, 1977. Again, he had it move west and pass over the hole on April 10, 1981, and then to the east over the hole on December 5, 1981. He thus presented a migrating boundary line that shifted the jurisdictional location of the well back and forth between the States. As previously noted, the Louisiana witnesses had the boundary line always

to the east of the well. The witnesses therefore were in conflict with respect to the years 1975, 1976, 1977, and 1981.

The Master, in his Report, at 16-30, reviewed in detail and carefully analyzed the evidence for the disputed years. He noted that any inference as to the migration of the boundary must be made by reference to the navigational lights, the changing water depths, and the configuration of the riverbed as revealed by the surveys. *Id.*, at 17. As to 1975, he had problems with Mr. Smith's testimony as to the manner in which a navigator would proceed downstream between the Gibson Light and the Giles Bend Cutoff Light, and as to a failure to take advantage of the first 3,500 feet of the lower trough of deep water.

As to 1976, the Master felt that witness Smith's boundary line was plausible as an indicator of the probable route of downstream traffic in the ordinary course. *Id.*, at 25. The Master concluded, however, that maximum use of deep water led to a sailing line similar to the one the Master inferred for 1975; this also would have allowed the mariner to keep his tow pointed down river with no sharp turns and without encountering hazardous water within the crossing environment. He noted that a mariner proceeding along witness Smith's boundary line would nearly overrun a black buoy (ordinarily to be given a wide berth on the starboard side going downstream) and would have a second black buoy to port as he passed that buoy. *Id.*, at 26. Mr. Smith defended this position on the ground that the second buoy appeared to be off station.

As to 1977, Mr. Smith's boundary line reflected a straight course across the neck of Giles Bend and passed to the west of the well by 750 feet. *Id.*, at 27. The Master found "no evidence in the record" to support this placement of the line. *Ibid.*

As to 1981, while a course along Mr. Smith's boundary line would encounter no hazards within the crossing, the Master observed that it would fail to make use of substantial portions

of the deep water troughs and thereby would lengthen the crossing. *Id.*, at 29.

Thus, for the disputed years, the Master found either that the Smith line did not conform to the data available on the surveys, or that it was not conceivable that a mariner would adopt Smith's track of navigation and disregard important navigational aids such as lights and buoys, or that the Smith line failed to utilize substantial stretches of deep water, or that it bore little or no relationship to the course recommended by the Coast Guard. For each of those years, the Master then concluded that the route of the downstream traffic in the ordinary course passed to the east of the well.

Mississippi, of course, takes exception to the Master's conclusions. It stresses what it regards as the unparalleled expertise of witness Smith as a potamologist with decades of specific experience in the field. Mississippi suggests that the Master failed to understand Smith's testimony. Exceptions, at 11. It is said that witness Smith used all, not just part, of the data submitted. It is said that the Master did not grasp the concept of "filling the marks" and "breaking the tow down." Mississippi urges that the Master was in error in concluding that Smith did not use the navigational aids. All were used by Smith, it claims, in interpreting the hydrographic raw data. *Id.*, at 20. It asserts that for 1975 Mr. Smith was correct in picking a course that took advantage of the deep water, the swift water, and the shortest distance through the crossing. *Id.*, at 29. It says the same thing as to 1976. It stresses Smith's conclusion that the one black buoy was off station and that witness Odom's so-called "geological thalweg," that is, the deepest part of the river, also runs over the same black buoy. As to 1981, Mississippi asserts that there is no factual basis for the Master's statement that Smith's course lengthened the crossing. It is the Master's course that necessitated sharp turns. Thus, it is claimed, the Master's course does not square with either the

data or the "practical realities of navigating large tows on the river." *Id.*, at 37.

These recitals, it seems to us, reveal the presence of a not unusual situation. Qualified experts differed in their conclusions. The Master heard all the testimony and drew his own conclusions. His recommendations to this Court are based on those conclusions. We have made our own independent review of that record and find ourselves in agreement with the Master. Louisiana's experts interpreted the hydrographic surveys for the years in question. They also considered the recommended sailing course as established by the Coast Guard. To be sure, the Coast Guard is not in the business of establishing state boundaries; it is, however, in the business of recommending safe sailing courses.

We therefore confirm the Master's recommendation and conclude that at all relevant times during the period from 1972-1982 the boundary between Mississippi and Louisiana was east of the bottom hole and, therefore, that the bottom hole was to the west of that line and within the State of Louisiana. This conclusion obviously resolves the case so far as the Louisiana and Dille leases, and the consequences that flow therefrom, are concerned.

IV

Mississippi's objections are addressed secondarily to the Master's refusal to delineate a specific boundary in the area for each of the 11 years from 1972 to 1982. It asserts that the Master's statement, Report, at 31, that the issue from the very beginning of the litigation has been "the location of the boundary in relation to the bottom hole" is, "in the purest sense, . . . simply not true." Exceptions, at 38. The principal issue, thus, "floats amorphous in the ether." *Id.*, at 39. Mississippi speaks of regulatory and taxing authority and of the problem of the drainage of oil from the Dille property. It is said that Mississippi must have the exact location of the boundary so as to prescribe the limits of drilling units on the

Mississippi side of the river. A precise determination would also inure to the benefit of Louisiana. Mississippi asserts that Louisiana really requested this determination all along.

The Master specifically declined "to draw my own version of the boundary line for each of the 11 years for which hydrographs were admitted in evidence." Report, at 31. For him, it would be "wholly gratuitous and improper to draw a boundary line for seven undisputed years and for four years in which the well was found to be on the Louisiana side." *Id.*, at 32.

We agree with the Master's conclusion that, despite any inferences that otherwise might flow from the specific prayer for relief in Louisiana's complaint, this original-jurisdiction litigation, as the case developed, centered, and remained centered, on the oil well's bottom hole. That issue emerged as the one, and the only one, to be resolved. Mississippi's stated reasons for granting complete yearly boundary relief are not persuasive, for we perceive no controversy before us apart from the location of the bottom hole. A proposed boundary decree for the entire stretch at the most would determine where the boundary was, not where it is now or where it will be in the future. Mississippi concedes that a boundary fixed for 1982 "would not be the boundary after that year," Tr. of Oral Arg. 9; that Mississippi was not making any claim for taxes for the 11 years, *id.*, at 20; that it had not established drilling units on the Mississippi side, *id.*, at 21; and that possible drainage of oil from the Dille land was the Dille's "private concern . . . not the concern of the State," *id.*, at 11-12. We are given no consequence that would flow from a more particularized boundary determination for these 11 years of the past.

The situation, of course, would be different, at least as to some of the years, had witness Smith's views prevailed. And if and when the boundary moves far enough west to place the well in Mississippi, then that State would have power to tax or to regulate the flow of oil, and drilling units

perhaps would become pertinent. But the exact location of the boundary in 1982 and earlier years has little bearing on evidence that might be produced in the future as to the boundary in that future. Taxes, and the other items referred to, have assumed no posture of critical significance between the two States for 1972–1982, and there has been no special claim identified for that period. It was the producing well's location that was the prize. If other boundary consequences mature and really come to issue between the States, either, of course, is free to institute appropriate litigation for their resolution.

V

The exceptions of Mississippi, therefore, are overruled. The recommendations of the Special Master are adopted and his Report is confirmed. We hold that at all times since the completion of the well in 1972 its bottom hole has been within the State of Louisiana.

If a specific decree to this effect is needed or desired, any party may prepare a decree and submit it for this Court's consideration.

It is so ordered.

