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Judicial Notice of Scientific Facts

Jon C. Kleri

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JUDICIAL NOTICE of a certain fact or matter which is before the court occurs when the court accepts it as true without requiring evidentiary proof.[1] A court may take cognizance of a fact when it is within the general or common knowledge of well informed persons.[2] For example, in *South and North Alabama Railroad Company v. Wood*,[3] the court held that various factors including the flow of water, the alternation of the seasons, the difference between night and day, seed and harvest time, the operation of mechanical power, and matters of similar nature are so generally known by all men that they need not be proved. The test of "universal notoriety" [4] is commonly applied by the court in order to justify acceptance of a certain fact as being within the area of common knowledge.[5]

The practical purpose of judicial notice is to dispense with the necessity of taking proof to establish a well known or accepted fact or proposition.[6] However, courts are not bound to take judicial notice of matters of fact. Their acceptance or rejection is dependent upon the nature and scope of the subject matter as it relates to the issues in any given case in conjunction with the overall justice applicable to the matter.[7] A court will not take judicial notice of a fact where there is doubt or uncertainty regarding its acceptance or notoriety.[8]

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1 9 Wigmore on Evidence 531 (3rd ed. 1940). See also Beardsley v. Irving, 81 Conn. 489, 71 A. 580 (1909).

2 State v. Finch, 128 Kan. 665, 280 P. 910 (1929).

3 74 Ala. 449, 47 Am. Rep. 819 (1876).

4 See Brown v. Piper, 91 U. S. 37, 23 L. Ed. 200 (1875), patent infringement suit where it was held that the court will take judicial notice of a matter which is within the common knowledge and use of the people. The court stated, "facts of universal notoriety need not be proved."

5 1 Schweitzer, Cyclopedia of Trial Practice 488 (1954).

6 State ex rel Schmittou v. City of Nashville, 208 Tenn. 290, 345 S. W. 2d 874 (1961).

7 City of St. Louis v. Niehaus, 236 Mo. 8, 139 S. W. 450 (1911). See Kamo Electric Cooperative Inc. v. Divke, 296 S. W. 2d 905 (Mo. 1956).

8 Schweitzer, *op. cit. supra* n. 5, at 489.

Since judicial notice takes the place of proof, the litigant should request the court to take cognizance of the fact as being within the area of common knowledge subject to judicial notice.[9] Courts are not required to inform themselves of facts not within their actual knowledge as the burden of proof cannot be shifted from the litigant to the court.[10]

As a preliminary step the court will determine whether the fact is within the area allowing application of the doctrine of judicial notice.[11] But a ruling by the court that judicial notice will be taken of a certain fact is not conclusive, as the matter is merely accepted as being true without requiring the party to prove it by means of evidence.[12] Since the opposing party is allowed to dispute the matter if he feels it is disputable, he should request the court to allow him to cross-examine in order to show why the court should not take judicial notice of the matter.[13]

Among the various subjects of proof which qualify in the area of judicial notice is the field of science, which includes accepted and established scientific facts.[14] Before a court may take judicial notice of a scientific fact it must determine whether the fact has been accepted as dependable and reliable within the scientific community,[15] that is, the general acceptance of the device, method, technique, or theory from which an established scientific conclusion may be drawn and admitted into evidence.[16]

The court must also determine whether the scientific fact is so notorious that it is commonly accepted as being true and

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[9] Bear v. Kenosha County, 22 Wis. 2d 92, 125 N. W. 2d 375 (1963).

[10] Holtz v. Babcock, 390 P. 2d 801 (Mont. 1964). See Richardson Ford Sales v. Cummins, 74 N. M. 271, 393 P. 2d 11 (1964), holding that, "the Supreme Court will not take judicial notice of proceedings in a lower court."

[11] 2 Harper and James, Law of Torts 873 (1956). See Shea v. New York, New Haven and Hartford Railroad Company, 316 F. 2d 838 (1st Cir. 1963).

[12] Ex parte Samaha, 130 Cal. App. 16, 19 P. 2d 839 (1933).

[13] 12 Belli, Trial and Tort Trends 181 (1962). See also Macht v. Hecht Co., 191 Md. 98, 59 A. 2d 754 (1948), where the court held that even though judicial notice permits the court to dispense with proof of a self evident fact the opponent may still dispute the fact if he believes it is disputable. See also Scheufler v. Contintenal Life Insurance Co., 350 Mo. 886, 169 S. W. 2d 359 (1943), where the court held, "The taking of judicial notice of a matter is not necessarily more than a prima facie recognition of the matter, and does not import that the matter is indisputable."

[14] Wigmore on Evidence, Students Textbook 480 (1935).

[15] Belli, *op. cit. supra* n. 13.

[16] Richardson, Modern Scientific Evidence 130 (1961).

therefore not subject to intelligent dispute.[17] This is based upon the principle that the scientific fact is known well enough to be accepted as common knowledge, thereby allowing the court to take judicial notice of it and dispense with the requirement of proof to establish the fact or proposition.[18] Even though some persons may disagree with the validity of a scientific conclusion, courts will take judicial notice of the accuracy of a given scientific conclusion as long as it is sufficiently notorious to be generally accepted by ordinary persons.[19]

Courts have traditionally applied the test of general acceptance as pronounced in the case of *Frye v. United States*,[20] as a standard to adjudge the validity and acceptability of the scientific principle.[21] The litigant should establish a foundation for the admission of a scientific principle which has not been judicially noticed because of lack of general acceptance within the scientific community.[22] The proponent can do this by establishing the scientific acceptance of the finding; by proving the reliability of the test; by showing that any scientific device used was functioning properly; and by showing that the technician or operator of the device possessed sufficient experience and skill rendering him capable to conduct the scientific test.[23]

Expert testimony is not necessarily a prerequisite for the taking of judicial notice.[24] Some courts, e.g., California, take notice of acts constituting malpractice, as did the California court in the case of *Agnew v. Los Angeles*.[25] In *Barham v.*

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[17] 1 Morgan, Basic Problems of Evidence 4-5 (1961).

[18] 1 Jones, Evidence 225 (5th ed. 1958).

[19] 2 Conrad, Modern Trial Evidence 201 (1956).

[20] 293 F. 1013 (D. C. Cir. 1923), here the court had to determine the admissibility of the results of a "lie detector test." The court in referring to the standard of acceptability stated in part, "Just when a scientific principle of discovery crosses the line between the experimental and demonstrable stages is difficult to define. Somewhere in this twilight zone the evidential force of the principle must be recognized, and while courts will go a long way in admitting expert testimony deduced from a well-recognized scientific principle or discovery the thing from which the deduction is made must be sufficiently established to have gained general acceptance in the particular field in which it belongs."

[21] Richardson, *op. cit. supra* n. 16, at 132.

[22] *Id.*, at 133.

[23] *Id.*

[24] 3 Averbach, Handling Accident Cases 39 (1960).

[25] 97 Calif. App. 2d 557, 218 P. 2d 66 (1950), California courts are permitted to infer malpractice by taking judicial notice that the failure to utilize X-rays as aiding in the diagnosis of bone fractures constitutes poor medical practice.

Widing,[26] the court took judicial notice that the failure to sterilize surgical instruments may result in a serious infection, thus inferring negligence on the part of the physician.[27]

A court will take judicial notice of scientific facts which include scientific developments, the laws of nature,[28] and the laws of physics and mathematics.[29] But a court will not take judicial notice of scientific facts which are mere possibilities and are not within the realm of general acceptance in the scientific community.[30]

The following cases, categorized under arbitrarily selected subject headings, have been chosen to illustrate the applicability and usefulness of the doctrine of judicial notice. But, it should be noted that this is a mere sample of some areas and therefore does not include all of the voluminous field of scientific facts subject to judicial notice by the court.

Scientific Tests and Devices

Automobiles—Radar

a. Defendant appealed from a conviction which was based upon a reading obtained from a radar speedmeter. The Supreme Court of New Jersey upheld the conviction, ruling that the reading was admissible as evidence without independent expert testimony by electrical engineers as long as the device was tested by the police and was in operating condition.[31]

b. In an Ohio case involving a similar factual situation, the court held that expert testimony explaining the scientific principles of the device was not necessary to admit the reading obtained from the device into evidence.[32]

Intoxication Tests

a. In upholding a conviction for driving while under the influence of alcohol, the court held that the conviction was justified on the basis of a reading obtained by use of a "drunkometer." In the past, expert testimony was needed to establish

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[26] 210 Cal. 206, 291 P. 173 (1930).

[27] Averbach, *op. cit. supra* n. 24.

[28] Conrad, *op. cit. supra* n. 19, at 200.

[29] *Id.* at 201.

[30] 1 Wharton, Criminal Evidence 141 (12th ed. 1955).

[31] State v. Dantonio, 18 N. J. 570, 115 A. 2d 35 (1955).

[32] City of East Cleveland v. Ferell, 168 Ohio St. 298, 154 N. E. 2d 630 (1958).

a scientific conclusion, but this is no longer necessary since the "drunkometer" is accepted as scientifically accurate and reliable to determine the alcohol content of the blood.[33]

b. In an Ohio case involving a conviction for driving while under the influence of alcohol, the court took judicial notice of the reliability of a blood, urine or breath test.[34]

Blood Grouping Tests

In a bastardy proceeding where the defendant was acquitted on the results of a blood test, the court held that it would take judicial notice of the accuracy of blood grouping tests.[35]

Explosives—Electricity—Lightning

Gasoline

a. Plaintiff sued the operator of a dry cleaning plant who had gasoline storage tanks on property adjoining plaintiff's property. The court held for the plaintiff, declaring that judicial notice would be taken of the fact that gasoline is of a dangerous and explosive nature.[36]

b. In a personal injury action where plaintiff was injured from the explosion of natural gas while a gas company workman was searching for a defect in a pipe in plaintiff's home, the court ruled that it is common knowledge that the injury sustained by plaintiff was not a result of spontaneous combustion, but of an intervening agency, the lighted lamp of plaintiff, which caused the explosion.[37]

Electricity

a. In an accident case, the Court of Common Pleas of Ohio held that the court would take judicial notice of the scientific fact that a traffic light bulb is liable to burn out at any time.[38]

b. In a wrongful death action where men were electrocuted while installing a television antenna which came into contact with a municipality's high voltage wire, the court held that it is

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[33] State v. Johnson, 42 N. J. 146, 199 A. 2d 809 (1963).

[34] State v. Szefcyk, 91 Ohio Law Abs. 66, 191 N. E. 2d 238 (1963).

[35] State v. Gray, 76 Ohio Law Abs. 393, 145 N. E. 2d 162 (1957).

[36] Whittemore v. Baxter Laundry Co., 181 Mich. 564, 148 N. W. 437 (1914).

[37] McGahan v. Indianapolis Natural Gas Co., 140 Ind. 335, 37 N. E. 601 (1894). This case is referred to in the later case of Indianapolis St. Ry. Co. v. Schmidt, 35 Ind. App. 202, 71 N. E. 663 (1904).

[38] Thompson v. Cooper, 43 Ohio Op. 182, 95 N. E. 2d 796 (1950).

common knowledge that electric current flows through a conductor.[39]

c. Judgment was rendered for plaintiffs (children ages six to eight) who were injured when they came into contact with an electrically charged rail of an electrical railroad. Expert testimony was not required because the nature of electricity is a scientific fact of which the court will take judicial notice.[40]

d. In a case involving injury to the plaintiff when electricity supposedly jumped to his hand from an insulated wire twenty-one inches away, the court ruled against the plaintiff, holding that it is a scientific fact that this was impossible, since the current would jump to the grounded metal only one inch away rather than to plaintiff's hand.[41]

Lightning

a. The court refused to take judicial notice in a workmen's compensation action where plaintiff's husband was killed by lightning which struck him while he was using a metal rake in his work chores. The court ruled that when there is a difference of opinion by experts as to scientific principles and deductions the court may not take judicial notice.[42]

Medicine—Health and Hygiene

Medicine

a. In an action against a physician who punctured cysts located on the ovaries of a woman upon whom he was performing an authorized appendectomy, the court held that there was no evidence of negligence on the part of the physician even though an infection later developed. The court took judicial notice of the fact that failure to operate upon the cysts would have resulted in future illness to the patient. In so doing, the court held that judicial notice can be taken of any fact in any field of science which is so notorious that it is not subject to reasonable dispute.[43]

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[39] Fowler v. Tenn. Valley Authority, 321 F. 2d 566 (6th Cir. 1963).

[40] Mullen v. Chicago Transit Authority, 33 Ill. App. 2d 103, 178 N. E. 2d 670 (1961).

[41] Coughlin v. Great Western Power Co., 183 Cal. 548, 191 P. 920 (1920).

[42] Mixon v. Kalman, 133 N. J. 113, 42 A. 2d 309 (1945).

[43] Kennedy v. Parrott, 243 N. C. 355, 90 S. E. 2d 754 (1956).

b. In a case against a physician for administering chloroform to a pregnant woman who died during the performance of an illegal abortion, the court took judicial notice of the harmful effects of chloroform but allowed the defendant to produce evidence to show an absence of criminal intent.[44]

c. In an action against the owner of a shoe factory by an employee who claimed he contacted pneumoconiosis while in defendant's employ, the court refused to take notice of this lung disease because of the conflict of medical authorities as to the causes of pneumoconiosis.[45]

d. An indictment charging defendants with the sale of cocaine, morphine and morphine sulphate, but failing to allege that the drugs were derivatives of opium leaves, resulted in a verdict for the defendants when the court refused to take judicial notice that narcotics were derivatives of certain leaves.[46]

Diseases

a. Animal. Plaintiff sued to recover damages for breach of warranty based upon the purchase of cows from defendant. The cows died of tick fever. The court held for the defendant noting that judicial notice may be taken of the causes of the fever but not of the time required for the disease to develop into a fatal stage.[47] For a court to take judicial notice of scientific facts they must be so notorious that they are a part of the general knowledge of men.[48]

b. Trees. Defendant was convicted for failing to destroy trees which were affected by "peach yellows." The court held that it would take judicial notice of the damaging effect caused by the disease known as "peach yellows." [49]

Health and Hygiene

a. Plaintiff brought an action against the defendant for breach of warranty based upon his contacting trichinosis from

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[44] State v. Tippie, 89 Ohio St. 35, 105 N. E. 75 (1913).

[45] Genesco Inc. v. Greeson, 105 Ga. App. 798, 125 S. E. 2d 786 (1962).

[46] United States v. Hammers, 241 F. 542 (S. D. Fla. 1917). See Barr v. State, 28 Okla. Crim. Rep. 392, 231 P. 322 (1924), where the court took judicial notice that morphine sulphate is a narcotic drug.

[47] Ramey and Hamon v. Hamilton and White, 234 S. W. 229 (Tex. App. 1921).

[48] *Ibid.*

[49] State v. Main, 69 Conn. 123, 37 A. 80 (1897).

pork purchased from defendant's store. Defendant contended that pork must be cooked to 137 degrees fahrenheit in order to be considered as being properly cooked. The court agreed, ruling that judicial notice would be taken of the scientific fact that one cannot contact trichinosis from pork cooked to 137 degrees fahrenheit.[50] In another trichinosis case the court took judicial notice of similar facts maintaining that these facts have been established by authorities in the field of science.[51] The court held that a scientific fact does not have to be known by everyone in order for the court to take judicial notice but that authorities in the particular field of science must be agreed to the fact.[52]

b. In a case where a state statute prohibited the introduction of oleomargarine, the court ruled that this food was pure and, therefore, the court could take judicial notice of the composition of said food product.[53]

c. A recent case which challenged the constitutionality of a Board of Health regulation requiring that all milk be pasteurized was decided in favor of the Board of Health. The court held that judicial notice could be taken of the scientific fact that harmful bacteria is found in raw milk.[54]

d. Fluoridation of water as a health aid has been accepted as being within the area of scientific facts of which the court may take judicial notice.[55]

e. Courts have taken judicial notice that vaccination is a preventive of smallpox,[56] and of the composition of the vaccine as a scientific fact.[57]

f. Where the defendant failed to obtain a contract from the city to haul garbage, the court took judicial notice of the scientific fact that animal and vegetable matter decay in a short pe-

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[50] Golaris v. Jewel Tea Co., 22 F. R. D. 16 (N. D. Ill. 1958).

[51] Nicketta v. National Tea Co., 338 Ill. App. 159, 87 N. E. 2d 30 (1949).

[52] *Ibid.*

[53] Schollenberger v. Pennsylvania, 171 U. S. 1, 18 S. Ct. 757 (1898).

[54] Schlenker v. Board of Health, 171 Ohio St. 23, 167 N. E. 2d 920 (1960).

[55] Kraus v. City of Cleveland, 163 Ohio St. 559, 127 N. E. 2d 609 (1955).

[56] Viemeister v. White, 179 N. Y. 235, 72 N. E. 97 (1904).

[57] Jacobson v. Massachusetts, 197 U. S. 11, 25 S. Ct. 358 (1905).

riod of time.[58] Matters of hygiene are scientific facts which are of common knowledge and are therefore generally known.[59]

g. When the court revoked the permit of a hog ranch operator, it held that it would take judicial notice of the scientific fact that rats and flies are a detriment to the health of human beings.[60]

Laws of Nature

a. In an action by plaintiff for injuries to his foot which was caught in a defective sidewalk having a hole in it three to four inches wide, the court ruled that evidence that one could catch a foot in a hole this size should not be rejected as a physical impossibility.[61]

b. In a manslaughter case, the Supreme Court of Illinois took judicial notice that there are certain limitations on human eyesight. The court disregarded testimony by witnesses for the prosecution who claimed ability to identify the accused by a mere glance under adverse weather conditions, at night, and at a great distance as being contrary to general knowledge and experience.[62]

c. The court took judicial notice of the violent nature of "Hurricane Hazel." [63] By this action the court maintained that the violence and destructiveness of a natural phenomena such as a hurricane was within the realm of common knowledge.[64]

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[58] Valley Spring Hog Ranch Co. v. Plagmann, 282 Mo. 1, 220 S. W. 1 (1920).

[59] *Ibid.*

[60] Cantrell v. Board of Sup'rs. of Los Angeles County, 87 Cal. App. 2d 471, 197 P. 2d 218 (1948).

[61] Marley v. Arkansas City, 135 Kan. 688, 11 P. 2d 704 (1932), here the court stated, "To disregard testimony as contrary to settled laws of nature, testimony must be shown to be plainly incompatible with physical laws of undisputable physical facts." See also Sheppard v. Wichita Ice and Cold Storage Co., 82 Kan. 509, 108 P. 819 (1910), which held for plaintiff who sued for damages for injuries sustained when he fell into an open tank of hot water during his employment. This later case turned upon the issue of how dark it was when the accident occurred. The court ruled that the testimony by plaintiff's witnesses was not such as to be false or improbable.

[62] People v. Bentley, 357 Ill. 82, 191 N. E. 230 (1934).

[63] Smith v. City of Kinston, 249 N. C. 160, 105 S. E. 2nd 648 (1958).

[64] *Ibid.*

Laws of Physics

a. In a 1964 Ohio case,[65] plaintiff, an employee of defendant's railroad, alleged that he was injured when the engineer made an emergency stop to avoid colliding with another train, thereby causing him to be thrown to the ground from the caboose upon which he was riding. The trial court directed the jury to return a verdict for the defendant, maintaining that a train traveling at a speed of only three to four miles per hour would not cause a significant jerk even if it came to an abrupt stop.

The plaintiff appealed and the court of appeals recognized that it is established that a court may take judicial notice of a law of physics. However, the court of appeals reversed and remanded the case for a new trial, holding that the evidence raised a jury question as to whether the train did come to such a sudden stop as to cause plaintiff to be thrown to the ground from the caboose.[66] The court of appeals, then, refused to take judicial notice that a train traveling so slowly could not cause a sudden jerk when stopped suddenly.

b. There have been numerous "sudden jerk" cases, such as the one above, involving common carriers. One of these involving the injury to a passenger in an overcrowded streetcar resulted in judgment for the plaintiff when the court ruled that the plaintiff did not have to prove that the jerk was unnecessary and unusual.[67] The defendant contended that it was common knowledge that streetcars do not start in such a way as to throw passengers about and cause injuries to them. The court disagreed holding that plaintiff's failure to prove this as common knowledge did not justify a directed verdict for the defendant.[68]

c. In another streetcar case, the court ruled that the fall sustained by the plaintiff resulting from the unusual jerk of the streetcar amounted to positive testimony as to the nature of the movement of the streetcar.[69]

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[65] Alexander v. N. Y. C. R.R. Co., 197 N. E. 2d 822 (Ohio App. 1964), here the court held, "A court may take judicial notice of matters of science which would include a law of physics."

[66] *Ibid.*

[67] Cleveland Ry. Co. v. Hunt, 116 Ohio St. 291, 156 N. E. 133 (1927).

[68] *Ibid.*

[69] Cleveland Ry. Co. v. Merk, 124 Ohio St. 596, 180 N. E. 51 (1932).

d. In another case three years later, the court ruled that the plaintiff must show that the jerk was unusual, e.g., sudden, forceful, or violent in order to prove negligence.[70] Thus, this court was holding that a "mere jerk" was not evidence of negligence on the part of the common carrier.[71]

e. Then, in 1939, an Ohio Appeals Court affirmed the judgment rendered for the plaintiff who was injured when a bus in which she was riding stopped with a sudden jerk. The court cited *Cleveland Ry. Co. v. Merk*,[72] and ruled that the sudden jerk amounted to positive testimony as to the nature of the movement of the streetcar.[73]

f. In a wrongful death action where the deceased was killed when railroad cars suddenly stopped and threw him to the ground, the court ruled that the evidence presented a jury question in view of the testimony regarding the sudden stop.[74]

g. Another case involving the injury of a bus passenger cited *Cleveland Ry. Co. v. Hunt*,[75] and held that the sudden jerk was an inference of negligence because a sudden jerk is not normal in the operation of the vehicle.[76]

h. In *Spreng v. Flaherty*[77] the court refused to take judicial notice that an automobile traveling at a certain speed can be stopped within a certain distance, since evidence showed that adverse weather conditions prevailed and could have affected the distance in which the automobile could stop.

The courts have held in these cases involving the laws of physics that judicial notice could not be taken of a fact if such fact was found to be operating in association with other facts that might cause a contrary conclusion.[78] In these cases the matters at hand have been left to the decision of the jury.

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[70] Yager, Recr. v. Marshall, 129 Ohio St. 584, 196 N. E. 375 (1935).

[71] *Ibid.*

[72] Cleveland Ry. Co. v. Merk, *supra* n. 69.

[73] Fristoe v. Dayton Street Transit Co., 29 Ohio Law Abs. 351 (1939).

[74] Sunderland v. Pittsburgh and Lake Erie Railroad Co., 319 F. 2d 809 (3rd Cir. 1963).

[75] Cleveland Ry. Co. v. Hunt, *supra* n. 67.

[76] Miller v. Warren Transportation Co., 93 Ohio Law Abs. 213, 197 N. E. 2d 562 (1963).

[77] 40 Ohio App. 21, 177 N. E. 528 (1931). See State v. Ward, 105 Ohio App. 1, 150 N. E. 2d 465 (1957).

[78] *Ibid.*

Conclusion

The general purpose of the doctrine of judicial notice of scientific facts is to dispense with the need to produce evidence to prove a fact or facts which are known to all persons.[79] The question arises, though, as to who is to say that a fact is so notorious as to fall into the realm of common knowledge. According to Wigmore, "The law of evidence, applied by the court to particular instances will tell us." [80]

The laws of evidence maintain that in order for the court to take judicial notice of scientific facts they must be part of the general knowledge of men[81] or must be agreed upon by reputable men in a particular field of science beyond reasonable dispute.[82] For judges to determine the degree of consensus on a particular scientific fact they may refer to any reputable and recognized reference sources.

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[79] Wigmore, *op. cit. supra* n. 14, at 479.

[80] *Ibid.*

[81] Raney and Hamon v. Hamilton and White, *supra* n. 47.

[82] Nichetta v. National Tea Co., *supra* n. 51.