SPEEDING AND DUE PROCESS

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RECENT developments in the law concerning the proof of speeding violations disclose judicial awareness of technological developments, acceptance of a new method of proof, but a continued insistence, nevertheless, upon procedural requirements for a conviction. While the principles here discussed are generally applicable, we concentrate upon one state's approach to these problems.

States have undoubted and unquestioned police powers over their roads, at least insofar as speeding by private persons is concerned.1 We are not concerned with the existence or the use of this power of control, but rather with the method of its effectuation and its abuses, considered either in constitutional terms of a deprivation of property without due process, or else within the framework of procedural due process.2

First the possible methods of effectuating control over private speeding are considered, and, secondly, the due process abuses which may be found. In the first aspect we touch upon a recent judicial policy change, while in the second, we see a continued rigidity in procedural requirements.

I. METHODS OF PROVING SPEEDING VIOLATIONS

We assume a speeding violation. In general, how may it be proved? There are several ways to do this, but only a few are here touched upon.

A. Opinion Evidence

The first general method utilizes sensory perception, and involves the opinion of any ordinary witness, not necessarily an expert, as to the speed of the automobile.3 All that is required, as a basis for the admissibility

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1. Johnson v. Maryland, 254 U.S. 51 (1920), held that a state could not arrest a postal employee for driving a mail truck in the performance of his functions without first obtaining a state license. But, said Mr. Justice Holmes, "an employee of the United States does not secure a general immunity from state law while acting in the course of his employment." Id. at 56. As to state power to exclude automobiles from the roads, see Walker v. Commissioner, 40 Pa. Super. 638 (1909), and more recently, Perlmutter v. Greene, 259 N.Y. 327, 182 N.E. 5 (1932).
3. See, e.g., People v. Dusing, 5 N.Y.2d 126, 128, 155 N.E.2d 393, 394 (1959) which declared: "Admissibility and weight of opinion evidence and measuring device evidence in speeding cases governed by the same rules applied in other types of cases. Qualified [not expert] individuals at appropriate observation posts have always been allowed to state opinions as to speed . . . ." See also People v. Boehme, 1 Misc. 2d 629, 152 N.Y.S.2d 759 (County Ct. 1955).
of this testimony, is some experience in observing rates of speed, or even some other satisfactory reason for the opinion. Obviously, the testimony of one who has often judged speeds is more believable than that of an ordinary person, but this goes to the weight, not the reception, of the evidence. This method of proving a violation may often degenerate into a witness-calling contest, and the judges are beset with the usual fact-finding problems. The trial lawyer is quite familiar with these techniques. Moreover, since it is subjective evaluations which are cast one against the other, problems arise as to the physical abilities of the viewer-witness, the conditions of observation, the background and experience of the witness, his driving over the years, his opportunities to gauge speed, whether he ever did so, how it was checked, etc., and, more importantly, if the speed involved is 40 m.p.h., the question of exactitude. In other words, how expert in evaluating speeds is the witness, and even then, does this involve judging from a moving or standing object? Each of these areas lends itself to searching, and, perhaps, scathing cross-examination.

B. Mechanical Devices

The second general method of proving a speeding violation is by the use of a mechanical device, rather than a person's senses and his opinion based thereon. A parallel may now be drawn, albeit loose and easily assailable. In the opinion aspect, a person must testify as to his sensory perception, for it is only the direct observer who can give such an opinion. The cross-examiner, in effect, divides his approach into two phases—first, an attack on the witness' sense abilities and opportunities to observe, the basic or raw data, which may also be called the objective aspects; second, an attack upon the opinion as a conclusion; here the subjective aspects are involved, so that a witness' background in gauging speed, opportunities in the past to estimate, etc., all enter the picture. If we are to substitute mechanical devices, then such devices must replace either the objective aspects of our human witness, or the subjective, or both, and thus be a

4. The skill and experience of an expert witness is to be determined, in the first instance, by the reasonable discretion of the nisi prius judge, and this expertise is not subject to review unless a clear abuse of discretion is disclosed. Mieselman v. Crown Heights Hospital, 285 N.Y. 389, 34 N.E.2d 367 (1941).

5. If the driver testifies he was going exactly 40 m.p.h., a People's witness may testify as to 50, a second as to 45. If there is a 5 m.p.h. discrepancy in the People's case, should not "reasonable doubt" requirements result in an acquittal? And if a passenger testifies as to 40, does this not strengthen the defendant's case? Note that "exactitude" here is really a minimum requirement, i.e., the People's witness(es) must testify to "at least" 40 m.p.h. Yet, on cross-examination, can this not be simply attacked because of indefiniteness, etc.? For example, a witness may characterize the speed as being "very fast," Marcucci v. Bird, 275 App. Div. 127, 88 N.Y.S.2d 333 (3d Dep't 1949), but since this does not per se prove a violation of a 40 m.p.h. speed limit, it is insufficient.
combination of the two. But even a Univac cannot concoct facts but must first be fed data; afterwards, however, the evaluation rendered may not only be uncannily human but even better. So with mechanical devices to measure speed—they must be first fed the raw material in order to render evaluations and conclusions. Experience tells us whether or not a certain device, when properly fed and used, is capable of simulating, and even surpassing, the human mind. When this occurs, the device is accepted, in time, by all authorities, including the judiciary, as a suitable, and perhaps even better, substitute for the human opinion, provided it functions properly. In other words, the device is accepted generally, but in particular instances may malfunction. Here, therefore, are several areas which cannot be exclusively machine-controlled, but require human testimony.

The first possible gap in the use of a device is found in specific-particular feeding of raw material to it. The question then arises whether the particular machine is functioning properly. Either proof is required that such machines will do their evaluating job satisfactorily, or the judiciary must accept the device generally as a substitute for the human mind without the necessity of such proof.

Put differently, what is being attempted is the replacement of the human witness by a mechanical one, this latter witness not only gathering the facts, but also evaluating them. But where may error occur? Quite obviously, no error may occur within the machine itself in its theoretical functionings, otherwise, it will not be acceptable without detailed proof of such theory. But if the machine is not situated properly, then, as with the opportunity of a human witness to observe, its perfection qua machine is of no aid. Also, even if the opportunity to observe via proper placement is testified to, what of this particular machine’s functionings? As with the attack upon a particular human witness’ physical capabilities, such as poor eyesight, may not an attack be made as well upon a particular machine’s physical capabilities, e.g., that a screw is loose or missing? And even if placement and functioning are testified to, who so placed and tested the functioning? It is at this point that people who are experts in these machines must testify as to placement and functioning. For if we replace the human with the mechanical, there must be a basis, not only reasonable but sufficient, for the use of the latter. Otherwise, what protection would be afforded the layman if any person could “use” an x-ray machine, or a lie detector, or some other

6. On this subject, and the reasons why this writer objected to its judicial acceptance, although supporting its proper use by authorities, see Forsch, The Lie Detector and the Courts, 16 N.Y.U.L. Rev. 202 (1939), appended to the District Attorney’s brief on the appeal in People v. Forte, 279 N.Y. 204, 18 N.E.2d 31 (1938), which followed this writer’s suggestion as to rejection.
mechanical device, and without more, give admissible and sufficient testimony as to convicting conclusions?  

1. Speedometer

What are some of these mechanical devices that are available to the police? We mention three. First and foremost, of course, is the speedometer. Everyone who has ever driven or been in an automobile knows what this device, or its variations in appearance but not in principle, looks like. Generally, it is a circular, clock-like instrument with a moving indicator, like a minute-hand, which moves clock-wise and indicates, by reference to the numerals upon its face, the speed the auto is traveling. Originally, the speedometer was connected by a flexible cable directly to the front wheel gear. That wheel’s revolutions turned the gears through the cable into the instrument which now, by other gears, indicated the speed and simultaneously registered the mileage travelled. Today, most cars have their speedometers connected to the transmission, rather than a wheel, because of the resulting greater accuracy. This device remains in use and is probably the basis for more speeding convictions than any other device.

2. Radar Speedmeter

Another device departs from the purely mechanical speedometer and builds upon electronics. This device, termed a radar speedmeter, is described as follows:

It consists of a transmitting and receiving unit which sends out the radar beam and receives the impulse from the moving vehicle. The wave from the transmitting antenna is sent out on one frequency, and because of the speed of the approaching vehicle the deflected wave returns on a different and higher frequency. It is then translated into miles per hour by the electric speedmeter, which measures the difference in the frequencies of the transmitted wave and the received wave . . . .

The method of setting up and operating a radar instrument and its components is deceptively simple. The device consists of three parts—a transmitter-receiver placed on a tripod behind the car, a speedmeter set on the backrest of the seat, and a graph. The operator sits in the back of the car looking out of the rear window with the speedmeter in his line of vision and the graph set on a platform alongside the door within the car. As each car passes through the radar beam emitted by the transmitter, its speed appears on the speedmeter and a permanent record of the speed is made on the graph.

7. "In many instances, in the trial of a defendant for operating a motor vehicle while intoxicated, expert testimony is little more than inexpert conjecture. Rules of evidence as to what constitutes an expert witness are well established. Yet medical doctors are permitted to testify as experts on particular areas with which their training has slight connection. It is not uncommon for a physician to testify as to the reliability of a test he has never performed." Comment, 23 Brooklyn L. Rev. 257, 264 (1957).


9. Id. at 564, 147 N.E.2d at 729.
3. Foto-Patrol

A third device known as Foto-Patrol apparently is a combination of electronics and mechanics with a camera attachment to record the violator's license plate number and the alleged speed. It "operates on an electronic impulse principle which activates a strobe light and camera and when the setting of the machine is disturbed by a speed in excess of the setting, in this case 40 miles per hour, a light flashes and the camera then takes a photograph of the license place number of the offender and provides through a code the alleged speed." The method of operating the Foto-Patrol is as follows: "There are two parallel tapes, 36 inches apart, which are cemented to the roadway across the lane of traffic and then connected to two boxes connected to a camera and strobe light set upon a stanchion on the sidewalk alongside the curb. The device can be set at various speeds . . . [so that when an auto does not exceed that speed] nothing happens, but when passing at a speed in excess of [the one set], the light flashes and a photograph of the license plate is taken."

C. Opinion v. Mechanical Evidence

How "acceptable," in terms of the law of evidence, are these two general methods of proving a speeding violation, viz., ordinary opinion evidence, and the "device" method, this latter now including the speedometer, radar, and Foto-Patrol?

As to opinion evidence, admissibility is not necessarily equated with acceptability or sufficiency, and since the requirements of criminal law are generally applicable, requiring proof of the People's case beyond a reasonable doubt, it would appear that a disagreement between witnesses, without more, creates such a reasonable doubt as to result in an acquittal. Furthermore, the necessity of having the testimony of at least two expert witnesses, if such be deemed sufficient, in order to outweigh that of the defendant's "reasonable doubt," becomes financially difficult, if not impracticable. Since subjective imponderables are present in all these prosecutions, too many ambiguous factors, which permit some degree of assurance of conviction, may be involved to render worthwhile any reliance upon this method of proof.

11. Ibid.
14. Of course, it is entirely possible that the People can make out its case through the testimony of a hundred qualified witnesses, all unbiased and otherwise unassailable, as against a lone defendant's inexpert estimate based upon one day's driving experience. We are not, however, discussing the possible, but the probable, and the probabilities conduce to the statement made. See, e.g., People v. Given (County Ct.) in N.Y.L.J., May 15, 1959, p. 15, col. 2.
It is at this point that the human element necessarily gives way to the mechanical. For if a device can be utilized which proves, beyond peradventure of legal criticism, the violating speed, then all objections to a conviction should disappear. The first acceptable device, we may hazard, will probably be a mechanical one and be held to be sufficient, but not "perfect," for this purpose. In the attempt to attain perfection, new discoveries will be adapted to new devices, each seeking to better its predecessor until, finally, we may have every car fitted with an infallible device which automatically records a violation, punches a speeding ticket, assesses the fine, and records the payment! For the present, however, no such apparatus is on the market, and the question of the external and internal fallibility of the device remains important.

The first substitute for human opinion is the speedometer. As its mechanical principles are simple and direct, there is no reason why its theory should ever be questioned, since its use discloses no appreciable margin for human error during operation. Once the instrument is properly assembled and mounted, the human factor is eliminated, assuming, of course, that one's eyesight and opportunity to observe are not in issue. There are, thus, internal and external factors to be considered, but these are particular errors, not general ones. After hundreds of millions of miles of use, the speedometer has become accepted as a theoretically proper tool for measuring speed. Hence, a chase car may simply and easily trail a violator for any prescribed distance and record the actual speed upon the chase car's speedometer. Assuming nothing further, this reading is sufficient to convict.16

The testimony as to the speedometer reading is subject, however, to

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15. One reason for requiring a prescribed distance, e.g., one-quarter of a mile, is because the chase car may hit 80 m.p.h. in order to catch the allegedly violating car, even though the latter may be going only 40 m.p.h. If the chase car must catch the car speeding at 40 m.p.h. in 40 miles, and make up one mile in doing so, the chase car need go only 41 m.p.h. But if the chase car is to catch the same speeding car within one mile, it must go at least 80 m.p.h. before it reaches the car speeding at 40 m.p.h. which, if that is the speed limit, has never been violating the law at all. Thus the state laws require some prescribed distance to be covered at the speed claimed to be a violation.

This prescribed distance is not due to a constitutional requirement of due process, however, but is only statutorily prescribed, i.e., enacted by the legislature. Therefore a person may be held on a charge of going only 3 feet at a speed greater than permitted by the law. See, e.g., People v. Pett, supra note 10, at 979, 178 N.Y.S.2d at 554; People v. Magli, supra note 8, at 567, 147 N.E.2d at 731. To point up this nonconstitutional aspect, New York Vehicle & Traffic Law § 56(3) requires a prescribed distance, whereas City of New York, Traffic Regulations art. 6, § 60 (1958) refers merely to speeding regardless of distance. This apparently permits an officer within the city a "choice" of laws, assuming these two are not incompatible.

16. Of course, this assumption is not acceptable without more, and in part II of this analysis, we examine this aspect of this problem.
two overall objections, internal and external. As to internal objections, the concept flows from the recognition that machines, at least to the present, cannot think independently. Functional errors consequently remain uncorrected and either distort the results or give incorrect ones. The device utilized must therefore function perfectly as a machine, otherwise the built-in or other error factor renders its use in court injudicious. This built-in error may be eliminated, for again this device withstands the test of theoretical function and use, so that even an assembly-line production technique cannot ordinarily produce technological imperfections. Factory testing prior to shipping may reduce this margin for error to minute and judicially acceptable tolerances. The speedometer is judicially accepted as a properly functioning instrument when found in the average automobile, but the machine is still subject to being knocked “out of kilter” by various forces, to having a screw become loose, or some other malfunction. This requires that some inspection method be super-imposed upon that of the factory, so that when a particular speedometer is used for the exact measurement of speed, it will be without flaw. At this point, however, we can agree that a speedometer is, per se, theoretically, experimentally, actually, popularly, and judicially acceptable as a speed-measuring device, and that its general use for the ordinary purposes of securing speeding convictions may be judicially authorized. And such is the law, for the courts do accept speedometer testimony, subject to other requirements later discussed.

What of the radar speedmeter? This device is not strictly a mechanical one in the sense that it measures speed directly off the moving car itself, as does the speedometer; rather, the radar equipment is detached from the automobile, has no direct mechanical connection to it, and relies upon electronic principles as above described. At present we inquire not as to its actual operation and use in detecting speed, but whether the courts will, as with the speedometer, accept the radar device as generally suitable for use in speeding trials (subject, however, to later-discussed requirements). The background of the instant radar speedmeter is, of course, the notorious and widespread use of the radar principle during World War II, its continued use “in the armed services as well as on ships and aircraft and in airports,” and its present and future adaptation to other areas because of its past successes. The law enforcement authorities in practically every state, including the District of Columbia, use the radar speedmeter, and the lower courts in New York and courts elsewhere have discussed the device and carefully considered its use. “We think the time has come,” said the New York Court of Appeals, “when

17. People v. Magri, supra note 8, at 565, 147 N.E.2d at 730.
18. Id. at 566, 147 N.E.2d at 730.
we may recognize the general reliability of the radar speedmeter as a device for measuring the speed of a moving vehicle, and that it will no longer be necessary to require expert testimony in each case as to the nature, function or scientific principles underlying it . . . ."\textsuperscript{19}

Speedometer or radar speedmeter testimony is thus acceptable and admissible without the necessity of first laying a conceptual foundation, \textit{i.e.}, offering expert testimony as to the nature, function, and scientific principles underlying the machine. What of the third device mentioned, the Foto-Patrol? In the New York courts, the only reported discussion is that of a police justice who did not decide that such a device judicially ranked with the speedometer or radar as to admissibility without more, but merely, and superficially, held that its testimony might be received and used as one factor, directly evidentiary or corroborative, in determining the fact of speed.\textsuperscript{20} But here the nature, function, and scientific principles underlying the device (no longer required for the speedometer and radar) were discussed in the exhaustive testimony of a veteran consulting engineer in communications equipment manufacturing and by the patent attorney of the device who had worked on it in its developmental stages for ten years.\textsuperscript{21} In other words, as to this device there has been, a "first time"\textsuperscript{22} for its judicial consideration, but there still remains a possible future "first time" for its judicial acceptance without the presently required testimony as to its scientific principles. Hence for the Foto-Patrol, and similar devices, excepting the speedometer and radar

\textsuperscript{19} People v. Magri, supra note 8, at 566, 147 N.E.2d at 730. The court also justified this conclusion by pointing to other areas, e.g., photography, x-rays, speedometer readings, in which today their instrument-evidence "are freely accepted in our courts for their general reliability, without the necessity of offering expert testimony as to the scientific principles underlying them." Ibid. Prior to this decision the lower courts had not been consistent or uniform in their views on radar admissibility. See, e.g., People v. Jamison, 8 Misc. 2d 408, 165 N.Y.S.2d 906 (County Ct. 1957), and cases cited therein, where radar was rejected when no expert witness testified as to theory, operations, etc.

\textsuperscript{20} People v. Pett, supra note 10, at 979, 178 N.Y.S.2d at 553-54. The reason for this qualified statement is the following declaration by the court: "Officers Kuhn and Johnson who have been in the Police Department for some time, after being qualified, testified to their opinion of the defendant's speed. I am disregarding Officer Johnson's testimony, as he expressed some doubt as to whether his estimate of speed was independent of the Foto-Patrol; as to Officer Kuhn, his testimony was without qualification that in his opinion the defendant's speed was approximately 45 miles per hour, to which I have given consideration in deciding this case." Id. at 979, 178 N.Y.S.2d at 553. And the court's conclusion was not merely that the device "accurately recorded the defendant's speed at the time in question," but that this "was further substantiated by the tests made by the police cars which had been calibrated and the opinion of Officer Kuhn as to the defendant's speed." Id. at 979, 178 N.Y.S.2d at 554.

\textsuperscript{21} Id. at 977-78, 178 N.Y.S.2d at 552-53.

\textsuperscript{22} Id. at 979, 178 N.Y.S.2d at 554.
mechanisms, a conceptual foundation is still required before any testimony is permitted as to its use and functioning in a particular case.

II. Procedural Due Process

The judicially approved employment of a mechanical or electronic device to gauge automobile speeds, without a preliminary foundation, has just been analyzed. Now we examine its use in a particular situation. While the device, in theory and in production, may judicially be held reasonably accurate and satisfactory, and also free from malfunctionings, this is still only a vacuum generality added to a machine product not yet put into particular, actual use. When the speedometer or radar (or a Foto-Patrol, assuming satisfactory preliminary testimony on theory, etc.) is now actually used, and a reading therefrom is sought to be introduced into evidence as the basis for a conviction, what judicial requirements must first be met in order to admit such testimony?

These requirements may be termed procedural, if we distinguish them from the merits (substance) of the device itself, or they may be termed objective (external), if we contrast them with the subjective (internal) or theoretical functioning of the device. And even these objective or procedural aspects are not all of interest to us, or relevant to our inquiry. For example, we have just above mentioned that a reading therefrom is sought to be introduced into evidence. The reading is objective, and one judicial requirement is that the person reading and testifying must be able to observe and report; thus a defendant may examine as to the officer's ability to see, etc. Or, as in the radar device, if a permanent record of the speed is automatically made, so as to eliminate such objections there still may be objections concerning the actual operation of the recording portion of the device. And yet there is no legal question which here concerns us since it involves the resolution of the fact of the recording, or the weighing of the testimony in order to resolve the disputed recording fact. This type of objective fact is therefore not of interest to us, nor is it relevant or material to our analysis. What "procedural" requirements are, however, of importance and relevance? In this area we see a continued insistence by the judiciary upon practical and legal safeguards, and it is when the instrument's recording is sought to be introduced that procedural due process enters the picture.

A. Use of Speedometers

A speedometer, let us say, is used for the recording of the violator's speed. Assuming no objection exists as to the officer's ability to have seen

23. See, e.g., People v. Matthews, 4 Misc. 2d 278, 280, 155 N.Y.S.2d 873, 876 (County Ct. 1956) where on direct examination the arresting officer was asked: "'Q. Were you able to see the speedometer? A. Yes.'"
and read, the cases hold that before the speed may be testified to, there
must first be competent evidence that this particular speedometer was
functioning properly at that time.24 How and upon what may this finding
of fact be made? The best method would consist in having the speed-
ometer in the chase car properly tested and approved just prior to the
actual chase and arrest. This, of course, is ridiculous in practice. If a
test there must be, it need occur only a reasonable time before the in-
cident in question. What is such a reasonable time? Depending upon cir-
cumstances, a general and rough rule of thumb, apparently worked out
by one city's experience, sets it at a maximum of two weeks or fifteen
days, i.e., twice a month.25 The presumption of continuance may thus be
utilized, but does this not now place some onus upon the defendant?26
Should not the People be further required to have testimony introduced
that since the last examination (say it occurred ten days before the in-
cident) and up to and including the arrest, this particular car had not
been involved in any accident, had not suffered any breakdown, had re-
quired no repairs involving the speedometer or any of its connections,
etc.? In other words, the People should be required to show that the
condition of the car was the same at the time of the test as at the time
of the arrest.

24. See, e.g., People v. Wilson, 3 Misc. 2d 887, 159 N.Y.S.2d 789 (County Ct. 1956)
speedometer testing made two months after incident not sufficient); People v. Rothstein,
1 Misc. 2d 516, 518, 152 N.Y.S.2d 757, 759 (County Ct. 1955). In the Rothstein case the
court stated: "There is no evidence at all that the [chase or arresting] officer performed
the checking of the speedometer; he did not testify to any personal knowledge of the
speedometer's accuracy." 1 Misc. 2d at 517, 152 N.Y.S.2d at 758.

25. The reason for the suggested period is because the New York City Police Depart-
ment so tests its chase speedometers. New York City Police Rules & Procedures ch. 24, § 25.0
(1956). But it is difficult to state that a testing of three or more weeks after the arrest
would result in a different legal decision as to a basis for conviction. In People v. Dusing,
supra note 3, at 128, 155 N.E.2d at 394, the Court referred to People v. Marsellus, 2 N.Y.2d
653, 143 N.E.2d 1 (1958), where the "police car speedometer . . . had been tested some
weeks before against a 'master speedometer' which itself had not been otherwise tested."
The Marsellus case, however, whose opinion was by the same judge, discloses that "some
weeks" translates into "about six weeks," but this decision did not predicate rejection
of the chase speedometer's recording solely on the lapse of such time; the actual testing
was not disclosed by competent evidence and therefore was held not proved. To obtain
a clear-cut legal determination on this matter of time, a chase speedometer, whose proper
testing is testified to, must be the sole basis for testimony as to defendant's speed, and the
testing must have occurred "X" number of days before the arrest. "X" can now be varied
to a point which courts will hold to be an unreasonable period of time. Legally, this "X"
may be translated in 17 days, or 50, or 38; we are suggesting approximately 15, i.e., semi-
monthly.

26. One of the "fundamental rules" in speeding prosecutions is that the People have the
burden of establishing beyond a reasonable doubt every fact essential for a conviction.
For example, is tire pressure important? This is almost universally acknowledged to be so, for it is simply understood that the same tire inflated to 45 lbs. pressure will give a different speedometer reading than when inflated to 20 lbs. This means that the People's testimony should include the pressure of the tires at the time of the testimony and, independently, although possibly by the same witness, the pressure at the time of the arrest or reasonably close thereto (say, when having driven for about a half hour after the car was picked up, so as to give the air in the tire an opportunity to heat up and expand to its fullest).

What about the type or method of testing performed? For example, some testers disconnect the chase car's speedometer cable and then connect the chase speedometer to a master speedometer; this latter now measures the former by operating simultaneously with it so that both must register within a tolerable degree of accuracy. This, of course, is a testing in a vacuum, for it is not a speedometer in a test tube which is to be used in the chase car, but one which is in actual operation, connected to and with the car, bouncing along on a rough road, and subject to factors which may easily affect its accuracy. Thus, as do certain police departments, it is far better to have the testing occur upon the actual road to be driven or, since this may be impossible, then under simulated road conditions. One method is to keep the chase speedometer operating

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27. It may be argued by the People that even a 20 lb. difference cannot account for more than, let us say, 5% error, but if we take other tolerances and add them up we may discover a total possible error of over 10%. If the posted speed is 40 m.p.h., and the defendant is charged with doing 60, then even a 10% error will bring the violating speed down only to about 54 m.p.h., still much more than is required to convict. However, if the alleged speed is 45 m.p.h., a very close question may result, and here the benefit of the doubt should be given the defendant.

28. "In addition, the arresting officer also testified that he had not recently checked the speedometer nor had he checked the pressure in the tires on that day, and the observer police officer, too, testified that the pressure in the tires had not been checked when the speedometer was claimed to have been tested." People v. Schroeder, supra note 26, at 467, 170 N.Y.S.2d at 725-26.

29. The tolerance may be 1%, 2%, or 3%. There has been no case directly in point. A 3% figure, e.g., an error of plus or minus 1½ m.p.h. in 50 m.p.h., seems to be a reasonable one. Apparently, this is the figure utilized by the New York City Police Department in testing for speeds under 50 m.p.h., with a beginning 5% tolerance over that figure. This latter appears to be far too high. See People v. Jones, 10 Misc. 2d 1067, 171 N.Y.S.2d 325 (N.Y.C. Magis. Ct. 1958), aff'd, N.Y.L.J. (N.Y.C. Ct. Spec. Sess., App. Part), May 4 1959, p. 13, col. 4.

Although not so holding, in People v. Rothstein, supra note 24, at 517, 152 N.Y.S.2d at 758, the court apparently permitted a tolerance of one mile in speedometer checks at 60 and 30 miles, i.e., of approximately 1½% and 3% respectively. It is submitted that this latter figure is too great a percentage of tolerance but, as in all matters involving subjective views, this is a matter of opinion until a state's superior court renders a final decision.
and have the car’s rear wheels rotated by friction via a large motor-driven roller wheel which simultaneously measures the speed of a master speedometer.\textsuperscript{30}

The chase speedometer may thus test out to within, let us say, three per cent accuracy when measured against the master speedometer, but who “guarantees” this latter? Should not the master be likewise tested against a really accurate speedometer or other device about which no question of accuracy may arise? The answer is yes, in theory, but, practically, where do we stop? It is completely unreasonable to require first proof of accuracy of the master speedometer, then of the one against which the master has been tested, ad infinitum, and so, the law stops at the first point of testing. So long as there is a master speedometer which has been and is being used, and the testimony so indicates, then it becomes a sufficient standard of measurement.

\textsuperscript{30} The simulated road condition may perhaps be made more “perfect” by having the roller not altogether smooth, but with depressions, pockets, or bumps, etc. These are, of course, details which may affect the speedometer’s accuracy, and the suggested 3\% tolerance presumably takes care of this. On the testing, see People v. Jones, supra note 29.

\textsuperscript{31} See, e.g., People v. Tyler, 109 N.Y.S.2d 756, 757 (N.Y.C. Ct. Spec. Sess., App. Part 1952), where the court stated: “The accuracy of speedometers is a matter of general knowledge. Proof of accuracy carried back to proof of the accuracy of the master speedometer and all of its parts is not necessary in speed prosecutions.”

In People v. Marsellus, 2 N.Y.2d 653, 655, 143 N.E.2d 1, 2 (1958), the arresting officer testified that his car “had been calibrated or checked as to accuracy at a service station where State Police cars were customarily so checked. The officer’s testimony was that he stood by and watched while the employee of the service station checked the State car’s speedometer against a master speedometer and that the two speedometers registered the same speed.” The receipt of this evidence of speedometer testing was held to be error as a matter of law. Notice the court referred to the “receipt” of the evidence, i.e., via an individual who was not competent to testify as to the testing, not the evidence per se, assuming the tester himself testified and his qualifications were otherwise satisfactory and upheld. Does this language by the court of appeals signify that police cars may have their chase speedometers tested at and by a private “service station” which has a “master speedometer”? It is submitted that this goes too far. There should be an “official” master, owned and operated by the government involved, against which chase speedometers should be tested. If this is financially impossible or otherwise too difficult, then at the very least, a private service station’s tester should include, in addition to his testing testimony, other testimony that this master was installed at a certain date, tested or otherwise determined to be accurate by so-and-so, is likewise tested at stated intervals through the year, had been tested last on such and such a date, nothing has occurred physically to it since then, etc.

In People v. Pett, supra, note 10, a Foto-Patrol device was tested against a chase car, and the chase speedometer was compared with the reading of the device’s graph. The chase speedometer had also been tested for accuracy, and the resultant proof was that “Lt. Edwin Hauser of the Garden City police force was called as a witness and testified that he was in charge of having the speedometers of the police vehicles checked, taking them to Oman Brothers who have a dynamometer for the purpose of testing speedometers; that not only do they test the speedometer of the Garden City police vehicles but they also check
But even on this assumption, namely, that a master speedometer requires no proof of its own accuracy, but may be used as a standard against which the chase speedometer is to be tested, the question is still open as to who is to do this testing. The courts hold that not just anyone, e.g., the ordinary chase car driver, may step in and perform this test; rather, there must be some testimony of past driving experience, some training and instruction and experience in testing, before the witness may testify as to the actual test performed and give the result as to the accuracy of the chase speedometer. Whether or not a witness has so qualified is, of course, a question of law for judicial determination based upon the facts in a particular case.

Finally, on this aspect of our analysis, will it always be essential for the People to prove the accuracy of the chase speedometer by a previous testing against a properly functioning master speedometer through the testimony of a qualified tester who is actually in court and in the witness chair? Put differently, are we able to approach a point where the chase officer may testify as to the chase speedometer's reading without any further testimony by anyone, in person, concerning the accuracy of this chase speedometer? Notice that we ask if we are "able" to approach such a point, not can we approach it technologically, or are we so approaching it. For our term "able" involves a question of procedural due process in its evidentiary formulations, not mere technological abilities. On this narrow aspect of our inquiry, one magistrate in New York City has already held that proof by the speedometer tester in person is no longer required, although some other competent proof must be given that the testing did take place and what the results were. Here the statutory

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those of the police of Nassau County, Rockville Centre and the Park Commission." 13 Misc. 2d at 978, 178 N.Y.S.2d at 553. Here Oman Brothers may be said to be a "quasi-official" testing station; undoubtedly the police in that area do not have their own master testing device. But the acceptance of such a private concern is a far cry from "a service station where State Police cars were customarily so checked." People v. Marsellus, supra note 25, at 655, 143 N.E.2d at 2. The New York City Police Rules & Procedures, ch. 24, § 25.3 (1956), requires that the master speedometer assigned to each precinct be itself tested once in each three-month period.

32. In People v. Schroeder, supra note 26, at 467, 170 N.Y.S.2d at 725, the court stated: "The burden of proof is on the People to establish ... the expert qualifications ... of the police officer who it is alleged witnessed the claimed test ... [and of] their experience in testing speedometers, or in testing speeds and checking the same against speedometers to support the reception of testimony by the observer officer as to the claimed speedometer test." Although radar, not speedometer, testimony was involved in the Magri case, the court of appeals particularly adverted there to the sufficiency of the qualifications of the officers regarding the operation and testing of the device. People v. Magri, supra note 8, at 566, 147 N.E.2d at 731. See also note 35 infra.

33. In People v. Jones, supra note 29, at 1075, 171 N.Y.S.2d at 333-34, the court, inter
shop book rule embodied in section 374(a) of the New York Civil Practice Act was utilized, and, if this decision is upheld on appeal, it would appear that this should be the minimum evidence substituted for the absent tester.\(^{34}\)

We may, at this point, assume either that a properly tested and functioning speedometer has been used by the chase car, or else that it was not so checked (or that evidence of checking is lacking or faulty). What is possible upon the basis of the first aspect is discussed shortly; as to the second, may testimony even be given as to the chase speedometer's record? First, however, there is another preliminary requirement, namely, may any person so testify, or must the person desiring to testify be a qualified individual? As with the speedometer-testing officer, one case apparently holds that the chase officer who reads the speedometer must

alio, stated: "The security afforded defendants generally to the right of cross-examination is, in this instance, superfluous. In most instances this court has found that the right to cross-examination of the speedometer witness has been waived, and when exercised before this court, has yet to result in an impairment of the witnesses' observation of the routine mechanical test. Consequently, in the opinion of this court, we may now accept the scientific reliability of speedometer tests of motor vehicles made by our police department against their master speedometer in keeping with the trend established in the case of People v. Magri (supra)."

"In People v. Rice (206 Misc. 999) the only evidence as to accuracy of the speedometer consisted of two letters, received in evidence without foundation, purporting to establish accuracy. This was error, and there being no legal evidence on the point, the conviction was reversed. A similar 'certificate' from a mechanic, placed in evidence through a police officer, was deemed hearsay and insufficient to establish guilt, in People v. Greenhouse (136 N.Y.S.2d 675)." People v. Rothstein, supra note 24, at 517, 152 N.Y.S.2d at 758.

34. It is submitted that necessity often makes, re-makes, or un-makes rules of law. For example, if New York City had a hundred traffic cases a day set down for trial, it would require either a hundred different testers to testify as to their own testing of the particular car or, if one had tested five of the chase cars involved, he would have to attend five different trials in one day, maybe not all of them in the same court. If New York City has only a few testers, this would make it physically impossible for such testimony to be given in every case. Either New York City would have to hire more testers, who may still be involved in several cases at once, or "something" else must be done. As to the first alternative, lack of funds may preclude it. As to the second, this "something" else may be a compromise, as in People v. Jones, supra note 29. Whether or not this compromise is to be utilized depends however, upon its necessity in the first instance. This, it is submitted, is a fact possibly differing in every municipality and therefore no general rule for all the state should here be evolved.

Somewhat in point with the above analysis regarding the use of a statutory shop book rule to show proof of the accuracy of a chase speedometer is the situation in the Pett case. There the Foto-Patrol device was involved, but this was tested against a chase car's speedometer. The accuracy of the chase speedometer was proved by the use of "speedometer test certificates" which "records were made in the regular course of police business and filed in the Police Department files in the regular course of business." People v. Pett, supra note 10, at 978, 178 N.Y.S.2d at 553.
have some particular and special ability and training for this purpose. But assuming this ability to testify as to the speedometer reading, may it be given where the device is an untested one? The answer is in the affirmative, that "a reading from an untested speedometer ... is admissible ...." But, as the New York Court of Appeals has said, "evidence of the reading of an untested speedometer without more would be insufficient to sustain a conviction for speeding." In other words, an untested speedometer's reading can be utilized but not legalized. Can this ever occur? That is, can a conviction ever be had solely on the basis of an untested speedometer's reading? Unless a reversal occurs, the definitive answer is negative, both in the light of legal decisions and of reason. For it violates every concept of fairness, apart from other procedural due process requirements, that people should be convicted of a crime or receive a penalty solely upon the basis of a reading from an untested device which is subjected daily to stresses and strains, bounces and jars, and other knocks, any one of which might easily cause the device to err!

The question remains: If the reading from this untested device may be utilized, what is the "more" which may permit a conviction? May this "more" be a second untested device such as radar? May it be opinion testimony as to the speedometer's reading as well? The burden of proof is on the People to establish every essential fact to convict a defendant, including, in this case, the expert qualifications of the arresting police officer, who offered testimony as to his reading of the speedometer. The minutes of the trial before the Magistrate fail to show the previous instruction and training. In addition, such minutes do not show automobile driving experience of the arresting officer or his experience in testing speeds and checking the same against speedometers. This officer, therefore, did not meet such expert qualifications so as to permit him to testify to any alleged speed from a reading of the speedometer made by him. The Tanner case is not authority for the above cited statement, for there the reading was of an untested speedometer and the sole question was the background, experience, and qualification of the arresting officer to give an opinion as to the defendant's speed.

All of the cases cited in this analysis either assume the officer to be so qualified, or ignore it, or in effect reject it as a requirement. It is this last situation which is of importance, and it is this writer's opinion that the chase officer must disclose a general background of training or experience or both in his job; otherwise he is not qualified. Once this has been disclosed, he is qualified to read the speedometer and testify thereto without having introduced particular testimony as to his qualifications and expertise for so reading and testifying.

35. People v. Shroeder, supra note 26, at 467, 170 N.Y.S.2d at 725, declared: "The burden of proof is on the People to establish every essential fact to convict a defendant, including, in this case, the expert qualifications of the arresting police officer, who offered testimony as to his reading of the speedometer .... [citing People v. Tanner, 6 Misc. 2d 1007, 165 N.Y.S.2d 308 (County Ct. 1957)]. The minutes of the trial before the Magistrate fail to show the previous instruction and training. ... In addition, such minutes do not show automobile driving experience of the arresting officer or his experience in testing speeds and checking the same against speedometers. This officer, therefore, did not meet such expert qualifications so as to permit him to testify to any alleged speed from a reading of the speedometer made by him." The Tanner case is not authority for the above cited statement, for there the reading was of an untested speedometer and the sole question was the background, experience, and qualification of the arresting officer to give an opinion as to the defendant's speed.


38. In People v. Magri, supra note 8, the evidence disclosed that the radar had been tested against a chase speedometer car which drove through the beam, both speedometer and radar apparently jibing with each other. The speedometer was untested (no proof of accuracy appeared in the opinion), and the radar was held (even with other methods used) likewise untested. However, the independent opinion evidence of speed by two qualified and experienced police officers was held sufficient, together with the untested radar reading, to convict.
speed? So far, it is the latter which has been offered in evidence and which, if competent, has been held to be the necessary "more." For example, in *People v. Heyser*, the untested speedometer's reading was admitted but there was additional evidence which disclosed that the chase driver had "been driving for 18 years, during which time he 'had occasion to estimate the speed of moving cars' and which estimates of speed he had checked against radar as well as the speedometer, with the result that his estimates were correct or close . . . ." Of course this judicial language is in ultimate-fact terms, so that the evidentiary facts, testified to by the officer, are not found in the opinion. But we can see here what type of background and experience the court is concerned with so that it can find in the record that the chase officer has a sufficient degree of "expertise . . . in judging speed . . . ." At this point, we are back to our previous discussion wherein we analyzed the first general method of proving speed via a person's senses.

An untested chase speedometer reading, which per se is insufficient to convict, may thus be included in the bases for a conviction where "more," or a "plus," is added to this otherwise insufficient evidence. The real point in issue now comes down to this: the "more," or "plus," which is added to the admissible-but-insufficient evidence, must it per se be sufficient to convict? Put differently, to the speedometer evidence which is insufficient, we add a plus, *i.e.*, the chasing officer's competent opinion testimony [or that of his observing companion] as to speed, which opinion is separate and distinct from the speedometer-insufficient testimony. Now, if this

Our query assumes that the speed was clocked both by speedometer and by radar, independently and simultaneously, and that both devices were untested. This fact situation has not yet appeared in the cases.

40. Id. at 393-94, 141 N.E.2d at 555.
41. Id. at 394, 141 N.E.2d at 555.
42. Among the cases holding there was sufficient proof of this expertise are People v. Dusing, supra note 3 (radar); People v. Magri, supra note 8 (radar); People v. Heyser, supra note 37 (speedometer); People v. Mignocchi, N.Y.L.J. (County Ct.), Apr. 21, 1959, p. 15, col. 7 (speedometer); People v. Molnar, 184 N.Y.S.2d 23 (County Ct. 1959) (speedometer); People v. Pett, supra note 10 (Foto-Patrol). Cases holding there was an insufficiency of proof of expertise are: People v. Harndon, 180 N.Y.S.2d 799 (County Ct. 1959); People v. Charles, 180 N.Y.S.2d 635 (County Ct. 1958); People v. Tanner, supra note 35; People v. Matthews, supra note 23.

For information required to disclose this expertise, see in the above-cited cases the discussions and suggestions contained therein. See also People v. Wimmer, 182 N.Y.S.2d 148 (County Ct. 1959) upholding the qualifications. For additional and earlier New York cases, see Symposium: Radar Speedometers, 33 N.C.L. Rev. 343-81 (1955).

43. See, e.g., People v. Pett, supra note 10, at 979, 178 N.Y.S.2d at 553, wherein the court stated: "I am disregarding Officer Johnson's testimony, as he expressed some doubt as to whether his estimate of speed was independent of the Foto-Patrol."
opinion evidence possesses a degree of sufficiency and accuracy comparable to that discussed previously, then is it not per se sufficient to convict? If so, then why must this opinion-sufficient evidence be a plus? Need we add to speedometer-insufficient any opinion-sufficient? The logical answer is no, unless we are prepared to say that the opinion-sufficient is not really and truly sufficient in a criminal trial where an accuracy beyond that of a civil court is now required.45

Unless this be the necessary purport of the courts' opinions, it is strange indeed to hold, in effect, that speedometer evidence "should" be introduced even though it is insufficient. We are therefore confronted by the other alternative, namely, that opinion-sufficient evidence is not really sufficient in a total or complete sense. But now we find ourselves in a dilemma, for we add to speedometer-insufficient the "more" or "plus" of opinion-insufficient, and by the alchemy of judicial thinking, come up with a sufficiency of evidence for conviction. In effect, this is the dilemma encountered in the partly-dissenting opinion of the concurring judge in People v. Dusing.46 The judge felt that "if the officers' opinions [of defendant's speed] were not enough by themselves on which to convict, they are insufficient to establish the accuracy of the radar. I think that they were insufficient for either purpose."47

In this writer's view, the proper approach is that opinion testimony must ordinarily be sufficient per se, whereupon it may be used in an effort to convict. Since every trial undoubtedly finds the defendant opining to the contrary, the People's testimony and opinions are challenged by those of the defendant, so that we are back in an opinion(s) versus opinion(s) situation. This now degenerates into a witness-calling contest, and thrusts upon the harassed judiciary another fact-finding situation. A procedural method for so determining the issue, or a tipping of the scales, may be to utilize another "opinion," but this time a mechanical one, for an untested speedometer is not proof of a fact but is merely another opinion, if we accept the judiciary's basic premise. Under this approach, the relation between speedometer and opinion is no longer speedometer-insufficient plus opinion-insufficient equals a possible and legal conviction, but opinion-sufficient, as discussed, plus speedometer-insufficient equals a possible legal conviction. To repeat, this writer agrees with the dissent in the Dusing case48 that under the situation there

44. See p. 119 supra.
45. "[I]t has been held in civil cases that testimony as to the speed of a motor vehicle is admissible where such testimony is predicated upon the witness' observation on other occasions of an untested speedometer . . . ." People v. Heyser, supra note 37, at 393, 141 N.E.2d at 555.
46. 5 N.Y.2d 126, 155 N.E.2d 393 (1959).
47. Id. at 130, 155 N.E.2d at 395.
48. In his partial dissent, Judge Van Voorhis stated: "If this opinion evidence was
and now envisaged, the opinion evidence must be per se sufficient, although judicially this is not so.\textsuperscript{49}

What of the other assumption made previously, that a properly tested and functioning speedometer has been used by the chase car, and remains the sole evidence of speeding, no opinion or other evidence being found in the trial record. Is this a sufficient basis for a conviction? Yes, both in law\textsuperscript{51} and in reason, for if it were not sufficient, then we are back in the witness-jungle of opinions versus opinions. "Radar and speedometer readings are generally admissible and may be sufficient in themselves if enough to prove the radar to have been accurate, there is no logical reason on account of which the officers' estimates of the speed of the car would not have been sufficient in law on which to have based a conviction without any speedometer or radar reading."\textsuperscript{5} N.Y.2d at 130, 155 N.E.2d at 395. In other words, the majority's boot-strap procedure was found legally reprehensible, provided, and here is the nub of the problem, the opinion evidence was not per se sufficient.

But can we afford to ignore either the analogy to circumstantial evidence in criminal trials, or the doctrine of necessity utilized in many areas? See, e.g., Forkosch, Administrative Law § 215 (1956). From a practical point of view, and based upon the dreadful toll in lives and property, and their remarkable reduction when states have enforced strictly their speed laws, it may be that such a "loose" approach in procedural due process is required in this exceptional police power area. All this, of course, is a policy question, and while we are discussing policy in particular, we have not touched upon the general policy. It is suggested that the legislature is the proper agency to formulate this general policy, which might well be either a particular statute concerning the speeding laws, permitting the "insufficient" combination above discussed to be a good base for a conviction, or else a general statute in the evidence laws, permitting the introduction into evidence of an untested speedometer where a basis sufficient for its introduction, if not for conviction, is made out by opinion testimony.

49. That is, a motion to dismiss at the close of the People's case would be denied, as there would be no failure, legally, to make out a prima facie case, since the reasonable doubt requirement would have been met. This would not mean, of course, that if the defendant then proceeded with his case, the trial judge could not find, on the merits, for the defendant. All it means is that the People's case is sufficient for a conviction if the defendant elects not to introduce any evidence on his own.

50. Another possibility presents itself, namely, to have the speedometer made the basis for the conviction (not, as we are suggesting, that the opinion evidence be the basis and the speedometer the addition), with the opinion evidence corroborating it. Indeed, such is the law if we accept the statement that: "The radar speedometer may in this case be regarded as the untested speedometer in the Heyser case (supra) and, when taken together with the corroborative testimony as to speed given by the two police officers, and accepted by the trial court, the evidence is sufficient to sustain the conviction." People v. Magri, supra note 8, at 567, 147 N.E.2d at 731. The difference in treatment is not merely terminological, since the premises and conclusions may be logically extended to where the consequences prove abhorrent, but these are not here developed.

51. See, e.g., People v. Magri, supra note 8, at 566-67, 147 N.E.2d at 731 (by inference); People v. Heyser, supra note 37, at 393, 141 N.E.2d at 555 (by inference); People v. Tyler, 109 N.Y.S.2d 756, 757-58 (N.Y.C. Ct. Spec. Sess., App. Part 1952) (motorcycle speedometer reading held sufficient per se); People v. Jones, supra note 29 (only testimony as to speed was the speedometer reading).
there be reasonable proof of their accuracy.”52 But the proof of proper testing and functioning should now be carefully scrutinized in such a case, for too many errors, albeit honest, are possible.53

B. Use of Radar

To this point we have analyzed the procedural details and requirements in the use of speedometers for speeding convictions. In general, the same requirements are found present when other mechanical devices are used, e.g., radar and the Foto-Patrol. In the use of radar, as we have seen, no preliminary or foundation testimony is today required as to its theory and function as it is now on a plane with the speedometer. In its use, however, the judiciary analogizes to the speedometer, and requires that the expertness of the operating officers be shown.54 This now permits these officers to set up the radar, a step not found in the speedometer, and then to test it before its actual use (the speedometer-testing is usually done by a separate officer removed from the speeding location). There

52. People v. Dusing, supra note 3, at 128, 155 N.E.2d at 394.
53. See, e.g., the so-called proof in People v. Tyler, supra note 51. There the only proof of speeding was the motorcycle officer’s testimony that he followed the defendant for 75 feet and at no time did his speedometer register less than 60 m.p.h. On cross-examination, the witness said his speedometer was tested about a week before and a week after the incident, being found accurate on both occasions, “that a test observed by the officer [witness] was conducted against a master speedometer in the motorcycle headquarters.” 109 N.Y.S.2d at 757. It was contended that the failure to call the testing officer rendered the observing officer’s testimony incompetent and hearsay. Said the appellate court: “We do not agree with this contention. The test of a speedometer by a comparison with a master speedometer is a simple matter with a result visible to any observer of ordinary intelligence. It is as simple as comparing a clock to a wrist watch. The accuracy of speedometers is a matter of general knowledge. Proof of accuracy carried back to proof of the accuracy of the master speedometer and all of its parts is not necessary in speed prosecutions. The proof accepted in the present case has been regarded as sufficient ever since the enactment of the speed laws of the state and city.” Id. at 757-58.

It is suggested that such proof of accuracy is not proper under the later decisions. See note 31 supra; see also notes 33-36 supra, as to the use of a record under N.Y. Civ. Prac. Act § 347(a), and where the People’s case was insufficient. How much the fact that the speed was 60 m.p.h., on a 40 m.p.h. bridge (personal knowledge of writer), had to do with the conviction is unknown, but if the court had desired to convict on such a basis, it should have merely affirmed and not attempted to set up such a principle of law. As to the speed being half as much again as the law allowed, and the influence this might have upon a court, see People v. Heyser, supra note 37, at 394, 141 N.E.2d at 555, where the Court emphasized that the defendant’s speed was “half again as fast as he was permitted to by law . . . .”

54. The court in People v. Magri, supra note 8, at 566, 147 N.E.2d at 731, declared: “As to its operation, the evidence was adequate. The two police officers were sufficiently qualified in that respect by their training at the Connecticut and Police Department schools and by five years of experience with radar patrol duty. Officer Judge testified as to how the device was set up, checking its levelness by a liquid indicator, and how it operates.”
are thus four steps here which can be examined: first, the setting up of the apparatus; second, its testing; third, the use of the device; and, fourth, the testimony thereof.

As to the setting up of the apparatus, there is very little that can be said concerning this fact, for it is indeed a fact. The setting up and the testing seem to go hand in hand, for the latter determines whether the former has occurred properly. Put differently, apparently any person may set up the apparatus, but in the testing of the apparatus, flaws or errors may come to light. Thus the testing is the important detail here, with the testers also doing the setting up. And, as implied in one case, the testing must be "in reasonably close proximity to the time of the violation . . . ." The testing may be divided into two phases, although the cases are not clear as to whether both phases must be proved and tested correctly, or whether an omission of or incorrect result in one phase renders the device an "untested" one. Regardless, the equipment itself is set up as described earlier, and then its "levelness [is checked] by a liquid indicator . . . ." This levelness is required as the transmitter-receiver portion is movable, and if placed upon uneven ground, the flat radar beam may be easily misdirected unless the equipment is leveled off. At this point we can assume that while anyone may set up the equipment, not everyone can test it, and so the qualifications of the tester become not only important but essential. The leveling off test is not the only one performed. In People v. Magri, the court observed that:

On the day in question, the radar apparatus was tested for accuracy by running the chase car on two separate occasions through the beam, comparing the speed shown on its speedometer with the results on the graph, and recording the tests on the graph and the worksheet; and by striking a sounding fork, which is set by the manufacturer at 50 m.p.h., in front of the transmitter-receiver both before and after the violation. The results of these tests, however, do not appear adequately in the record. From the Magri quotation, it would appear as if the tuning fork test

55. Id. at 566, 147 N.E.2d at 731.
56. Ibid. See p. 126 supra.
57. Of course, the equipment may be perfectly level and yet thoroughly useless, as where the beam is upon a slight hill above the road, or in a slight depression below the road. A flat, level beam must thus pass above or below the moving car. In either case a non-level beam is a necessity, and can then be used, but here the only assumption is that no such geographical distortion or error is involved. On cross-examination, however, this possibility may be inquired into.
58. See, e.g., the comment concerning qualifications on this leveling aspect in note 54 supra.
59. 3 N.Y.2d 562, 147 N.E.2d 728 (1958).
60. Id. at 564, 147 N.E.2d at 729.
utilized is the one recommended by the manufacturer of the device, in the absence of any other available test. If this be so, then a “complete” testing of the levelness of the instrument, plus its effective and accurate functioning at various speeds (the manufacturer undoubtedly supplies different tuning forks for different speeds), can be made by a competent tester. The qualifications of this individual are thus of great importance.

In the Magri case, however, apart from the tuning fork test for accuracy, the chase car was run through the radar beam on two separate occasions, and the speedometer reading was then compared each time with the radar graph recording, presumably both registering alike. At this point, however, we must ask, how do we know the speedometer was accurate? In the testing of the speedometer against the master speedometer, we have seen that proof of the accuracy of the master is not required. Do we analogize and now say that the radar is matched or tested against a “master” device, that is, the chase speedometer? The question provides its own answer, for obviously, the proof of the accuracy of the radar cannot depend upon an untested speedometer. This latter device must itself be proved accurate, which takes us back into the speedometer area of proof, qualifications, etc.

It is evident, therefore, that if the radar device is to be of practical utility such speedometer comparison testing cannot be an essential requirement. Factually it seems not. Judicially, the Magri opinion, quoted above, separates the two methods of testing by a semi-colon, and begins the second method with the conjunction “and;” we must therefore conclude that the speedometer test was not held a legal requirement by the Magri court. In reason, too, this should not be a requirement, for one of two possibilities presents itself: first, the radar is to be used primarily for “speed trap” convictions; or, second, that the device is inherently and practically insufficient. As to the first possibility, we have another type of “dirty business” engaged in by government, and the court of appeals would not, or should not, knowingly give its judicial imprimatur to this; as to the second possibility, the courts have held otherwise.

Regardless, a possible error in this writer’s approach may be found in the Magri language. In that case a “more serious question . . . [was] presented as to whether the radar device was properly tested and thus recorded accurately . . . . While there is evidence of four [sic] tests

61. In the subsequent discussion of the Foto-Patrol device, it will be noted that in the Pett case a foundation of theory, etc., had first to be made before the device could be utilized. Then, according to the only testing method, a chase car was driven by and its speedometer reading compared with that of the device. This speedometer, however, was separately tested before these comparison tests, and the results of these speedometer tests put into the record, so that the speedometer’s accuracy was thus proved. People v. Pett, supra note 10, at 978, 178 N.Y.S.2d at 553.
made here in reasonably close proximity to the time of the violation, their results were not properly established in the record." Since the record disclosed separate speedometer-comparison and tuning fork testings, we cannot say that the former were not essential as a prerequisite to the proof of the radar's accuracy, where the court felt that the results of both tests were not properly established. Logically, we cannot state, on the basis of the Magri opinion, that if the results of only the speedometer tests of the radar equipment had been properly established in the record, the radar graph would have been admissible and per se sufficient (assuming the speedometer to be an untested one factually or legally); nor can we state that if the tuning fork tests had been properly established the radar graph would now have been admissible and per se sufficient. As a matter of logic, we cannot say anything significant except that both types of tests may have been there required.

Judicially, this may be the legal requirement but, in reason, this should not be so. As analyzed in the preceding paragraph, the only judicially required testing should be the tuning fork method employed by a qualified tester, and the accuracy of the tuning fork should not, vis-à-vis a master speedometer, ordinarily be the subject of proof or inquiry. This approach would, of course, in theory render superfluous or corroborative only the additional "test" by the chase car. However, three reasons may reject this theoretical approach in favor of the one utilized in Magri: first, a chase car is required to pursue and halt the violator, as no photograph of the license plate is taken, nor is there any stopping device utilized, although an officer may be stationed at a distance down the road to flag down the violator; second, a car or two must transport men and equipment, and conceivably such a car may be used for chase purposes; and, third, the experience, at least in New York, in the use of radar has so far always included a chase car, so that for some additional period of time it might be advisable to retain this type of set-up, now judicially approved.

The setting up and testing of the radar equipment may now be assumed proper and accurate, so that only the use of the device and the testimony need be inquired into. The use is simplicity itself, for the operator merely "sits in the back of the car looking out of the rear win-

62. People v. Magri, supra note 8, at 566, 147 N.E.2d at 731. The court held the radar to be on a plane of equality with the speedometer insofar as the untested-speedometer-plus-opinion speed-evidence could result in a conviction. Thus, "were the only evidence here that of the untested radar equipment, we would hold, as in the case of an untested automobile speedometer . . . that such evidence is insufficient to sustain a conviction for speeding. But there is in this case, as in the Heyser case, additional evidence . . . [by] two qualified and experienced police officers, who had adequate opportunity to observe defendant's vehicle . . . and who independently formed opinions as to its excessive speed." 3 N.Y.2d at 566-67, 147 N.E.2d at 731.
dow with the speedometer in his line of vision and the graph set on a platform alongside the door within the car. As each car passes through the radar beam emitted by the transmitter, its speed appears on the speedometer and a permanent record of the speed is made on the graph.\footnote{Id. at 564, 147 N.E.2d at 729.}

When the graph records a speed in excess of the posted one, the operator telephones a description of the violator to the officer in the chase car ahead who now flags down the car and issues a summons.\footnote{Id. at 565, 147 N.E.2d at 729.} In this use, or in the testimony relating to it, very little of interest to us occurs. Of course, the officers may have poor eyesight, insofar as vehicle descriptions are concerned, or insofar as sighting through the rear window of the car is concerned, but this is not material to our inquiry. Or the device may, at this particular instant, malfunction, but again this is not important save in the one instance. So far as we are concerned, there is no inherent procedural error of a judicial nature in this aspect of the conviction of a speed violator by the use of radar.

C. Use of Foto-Patrol

The only other inquiry we make involves the Foto-Patrol, which still requires preliminary or qualifying testimony of experts as to its theory and function, as did radar until the \textit{Magri} case. Everything from here on parallels the requirements for radar, for the setting up and testing of the equipment is procedurally necessary. In \textit{People v. Pett},\footnote{People v. Pett, supra note 10, at 977, 178 N.Y.S.2d at 552. In each case the speed of the chase speedometer and the device's photograph were identical, namely, 44 and 49 m.p.h. respectively.} the testing also included a comparison of the chase car's speedometer reading with a photograph of the chase car's license plate and speed as recorded simultaneously by the device, such comparisons being made before and after the violation had occurred. If we analogize to the approach heretofore taken in the radar situation, this comparison clocking was superfluous; it was, however, done and testimony thereof introduced. But, insofar as this analogy presupposes a testing independent of the chase car, e.g., in the radar testing a tuning fork was used, the \textit{Pett} case does not disclose any. Whether this is possible is not certain from the opinion, so that at least in this case, and for this device, the chase testing was procedurally necessary. Was it therefore additionally necessary to have proof of the speedometer's accuracy introduced? If not, then we would really have an untested speedometer used to test an otherwise untested device which is now used for a conviction. In the \textit{Pett} case there was, however, independent proof of the accuracy of the chase car's speedometer,\footnote{Id. at 978-79, 178 N.Y.S.2d at 553-54.} so that
the device could thus be said to have been "properly" tested. Despite the
device-proof offered and received, the People proffered additional testi-
mony so that the court could declare that "I have given consideration
[to the independent opinion testimony of speed by an officer] in de-
ciding this case," and could thus conclude "that the Foto-Patrol device
accurately recorded the defendant's speed at the time in question, which
was further substantiated by the tests made by the police cars which had
been calibrated and the opinion of Officer Kuhn as to the defendant's
speed." Note, however, that the device per se is apparently made the
basis for the conviction, "further substantiated" by the chase car tests
and the opinion evidence. As with the Magri "corroborative" testimony,
so here with the "substantiating" testimony, the device is the base and
the opinion is the more or plus.

CONCLUSIONS

The conclusions here possible would be mainly repetitious of the com-
ments already made. Procedural requirements are not corsetting rules
which render the states unable to engage in preventive legal education
in order to reduce the mayhem on their roads. The devices for convicting
violators here analyzed are opinion evidence, speedometer, radar, and
the Foto-Patrol. While opinion evidence is weak, and speedometers are

67. Id. at 979, 178 N.Y.S.2d at 553.
68. Id. at 979, 178 N.Y.S.2d at 554.
69. There are other devices which have been suggested or utilized. A suggested method,
albeit unlikely to be used or judicially accepted, is the use of a helicopter with a triangula-
tion device to spot speeders, radio to waiting police, together with a photograph to convict.
Another method, while apparently not used except in one county, is termed a "speed
watch." This was seemingly first used in 1955, as the decision in People v. Asheroff, 12
Misc. 2d 10, 174 N.Y.S.2d 525 (County Ct. 1955), is so dated, with the only other reported
decision therein being in the same court 27 months later by another judge, People v. Duskin,
11 Misc. 2d 945, 174 N.Y.S.2d 527 (County Ct. 1958). Both decisions upheld the use of
this device, but in the Duskin case, there was independent opinion evidence by the oper-
ating officer as to defendant's unlawful speed. As the court stated:

The 'speed-watch' is a device consisting primarily of two air hoses and a control box
which is attended by a police officer. The hoses are laid on the roadway perpendicular to
the direction of traffic and are set either sixty-six feet or one hundred thirty-two feet apart
depending upon the particular model of the machine being used. A mercury switch is con-
ected to each of the hoses which, in turn, are connected by an electrical wire to the control
box. Within the control box is located a third mercury switch, a stop-watch and a scale
which translates feet per second into miles per hour.

The first hose is activated by flipping over a switch on the control box which is located
three hundred feet or so further down the road from the hoses. When a vehicle approaches
which the police officer estimates to be exceeding the prescribed speed limit, he throws the
switch prior to the time that the wheels of the vehicle cross the first hose. As the wheels
cross the hose, air is forced out of the hose activating the mercury switch attached thereto
and the electrical impulse created thereby commences the operation of a stop-watch on the
control box. The officer then throws the same switch in the opposite direction thereby
activating the second hose. As the wheels of the vehicle strike the second air hose, a
second electrical impulse stops the stop-watch on the control box. The scale on the
machine, calibrated to translate seconds into miles per hour, indicates the average speed
subject to much error and failure of proof, radar and the Foto-Patrol offer much in the way of simplicity, economy and the like. It must be

of the vehicle as it passed through the sixty-six or one hundred thirty-two foot distance. 11 Misc. 2d at 946-47, 174 N.Y.S.2d at 528.

In the Duskin case, there was testimony by an expert of electronic speed devices and radar equipment who opined the machine was accurate; two operating officers testified as to their background and expertise and of two testings of the equipment, after it had been set up, which resulted in an accurate reading thereon. The court asserted that “expert testimony as to the scientific principles underlying the ‘speed-watch’ device is no longer necessary.” Id. at 948, 174 N.Y.S.2d at 529. However, since the actual holding in the case was that the opinion evidence of defendant’s speed, “when coupled with the evidence obtained on the ‘speed-watch,’ is sufficient to sustain a conviction for speeding” (citing the Magri case, supra note 8, and People v. Heyser, supra note 37), the court concluded that “it is unnecessary to consider appellant’s contention that the hypothetical question asked of the electronics expert was improper.” Id. at 948, 174 N.Y.S.2d at 530.

The Asheroff case referred to the background of the operator, also the arresting officer, who “had received a course of instruction in the operation of the speed watch, had operated it extensively for seven months last past and had frequently set it up and tested it,” and to the “great wealth of testimony . . . introduced seeking to establish the accuracy of the speed watch.” 12 Misc. 2d 11, 174 N.Y.S.2d 526. The court then mentioned the double checking and testing of the speed watch on the day of the arrest against two different police car speedometers, “and both [device and speedometer] speeds were identical.” Ibid. There was no independent opinion evidence as to defendant’s speed, and it was argued that the testing of the device against two “untested” police speedometers [proffered “test certificates” were held inadmissible; but see supra notes 33-34] could not permit a conviction solely on the registered device speed. The court replied that:

one cannot overlook the unchallenged testimony of Mr. Evans, an engineer employed by Sperry Gyroscope Company, whose qualifications were conceded by the defendant, that he was familiar with and had tested and examined the speed watch equipment, that it was capable of correctly ascertaining the speed of a motor vehicle within plus or minus two miles per hour and that in his opinion it would record the speed within the accuracy specified. This testimony alone would be sufficient to support the conviction. Moreover, despite the inadmissibility of the test certificates to establish the accuracy of the two police vehicle speedometers, testimony that three speed recording devices showed identical speeds on the same day that one recorded the speed of the defendant’s vehicle, even assuming none was tested, is not without probative value. Id. at 12, 174 N.Y.S.2d at 526-27.

It would appear that the “speed watch” device is not perhaps extensively used because too many failures may occur in the hose, the air pressure, the human element in throwing the switch, etc. The Asheroff case, on the device opinion alone, may have been improperly decided, although the Duskin case, because of the present independent opinion evidence, appears to have a legal basis. In People v. Watson (County Ct.), N.Y.L.J., Jan. 6, 1959, p. 13, col. 7, the only testimony referred to the speed recorded on this device. There the same judge who decided the Duskin case now construed the latter as supporting the proposition “that it is no longer necessary for the People to prove mechanical reliability of the ‘speed watch’ by means of qualified, expert testimony if the trial court is willing to take judicial notice thereof.” Id. at col. 8. As we have seen, this is not strictly accurate. Furthermore, the defendant’s contention that no proof had been submitted of the operator’s expertise with the device was brushed aside, as was the argument of insufficient proof of the testing of the equipment after it had been set up. Undoubtedly, there must have been a sufficient foundation, in the Watson case, for the conclusions of the judge, although, superficially the conviction would appear to be in error.
pointed out, however, that where states require a sustained speeding of, let us say, one-quarter of a mile, these two devices are simply not presently usable.° State laws on speeding should thus be overhauled to permit, not compel, these devices to be used. In so doing, however, a degree of discretion and latitude should be built into these permissive laws, as, e.g., where a driver speeds up to 60 m.p.h. for a hundred feet to avoid a possible collision.

The speedometer is still the favorite and only method where distance requirements are part of the speed laws. In this case the question of proving accuracy is a troublesome one. Provided reasonable safeguards are set, there is no practical reason why a statutory shop book rule section can’t be availed of to overcome the necessity of direct proof by the tester of the chase speedometer. Factually, a tester just cannot remember any car he has tested, and must refresh his memory by the use of his records. In effect, therefore, these records are in evidence, and any cross-examination is really of the records and an effort to impugn them. Provided a defendant is permitted to demand the presence of the tester, there appears to be no objection to the offering of these testing records into evidence in the first place.7

The use of speedometers requires chase cars and involves financial problems of maintenance, testing, and wages. Radar and the Foto-Patrol appear to offer good possibilities for a reduction of costs, especially if a photograph of the license plate and speed is made at the moment of violation. For now only two men are required, more places may be spotted, and no reason now exists why there should not be open check points. The state is not seeking an additional source of revenue but desires to reduce highway accidents where speed is a factor. If we cut down speed, and not just fine the violator, the toll of deaths and accidents may be reduced.

70. See, e.g., N.Y. Vehicle & Traffic Law § 56(3), which requires speed to be “in excess of fifty miles an hour for a distance of one-fourth of a mile . . . .” The People must prove the violating speed was maintained for such a distance. People v. Marsellus, 4 Misc. 2d 211, 157 N.Y.S.2d 148 (County Ct. 1956), rev’d on other grounds, 2 N.Y.2d 653, 143 N.E.2d 1 (1958). This does not prohibit municipalities from having a different yardstick or none at all. People v. Mangini, 194 Misc. 615, 87 N.Y.S.2d 34 (N.Y.C. Magis. Ct. 1948), upheld a New York City traffic regulation which was silent as to distance and convicted a defendant who had traveled at a speed greater than the city regulation regardless of the distance traversed.

Section 57 of the N.Y. Vehicle & Traffic Law limits speeds on the grounds of state institutions to 15 m.p.h., without mentioning distance. See also N.Y. Vehicle & Traffic Law § 57(a).

71. In the Jones case, supra note 29, the second department’s New York City Court, Special Sessions, Appellate Part, has apparently adopted this procedure. The first department, of course, may decide otherwise, as may the rest of the state. It is recommended, however, especially for uniformity, that the Jones decision be followed.