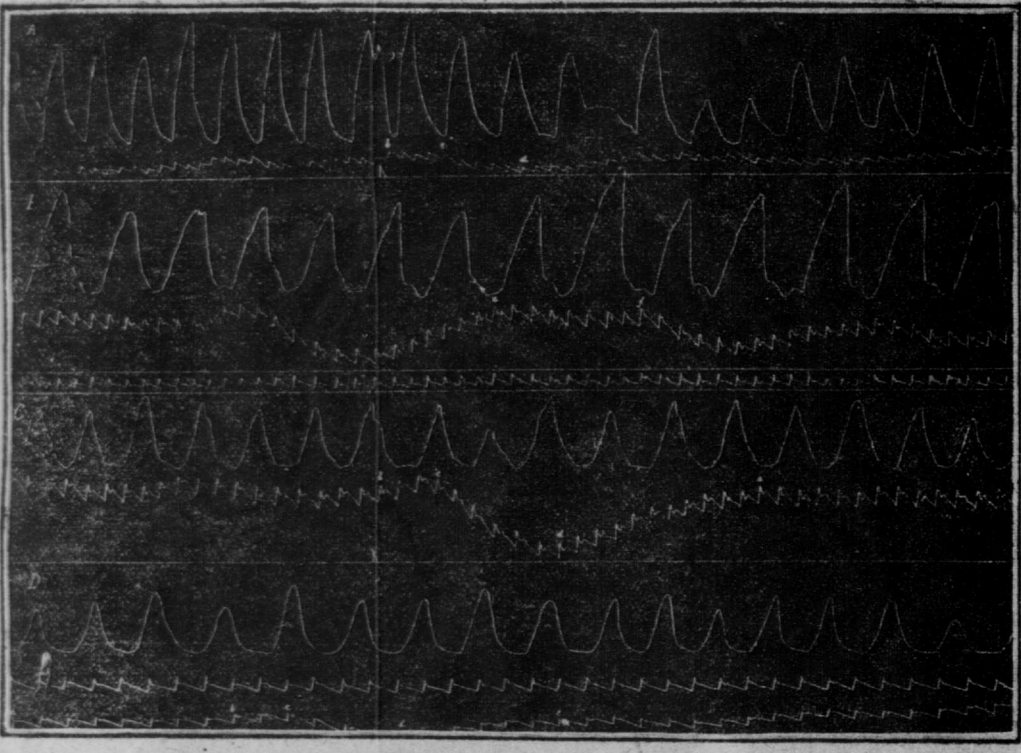


MACHINES THAT TELL WHEN WITNESSES LIE

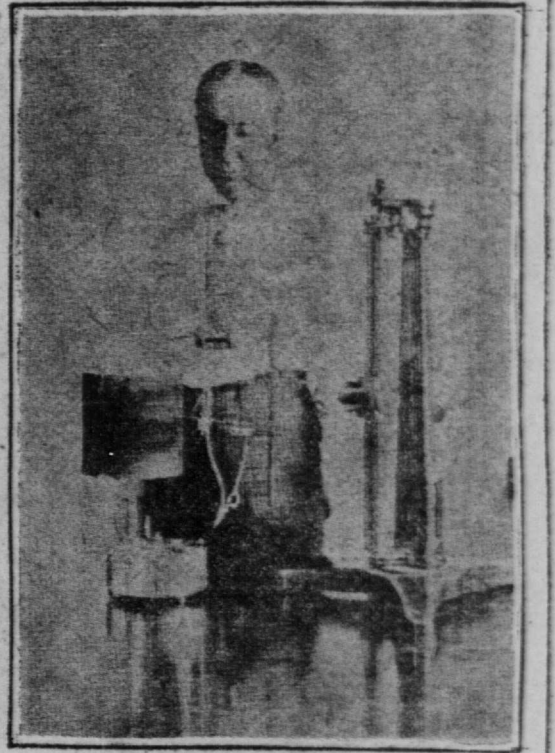
DID ORCHARD TELL THE TRUTH? PROF. MUNSTERBERG WILL GIVE HIS OPINION LATER BUT HERE'S THE WAY PSYCHOLOGISTS FIND OUT SUCH THINGS



A record of the pulse (smaller curve) and breathing (larger curve) of a person under examination. At certain points a sudden change in the curves indicates a sudden emotion.



The Automograph. A refined form of the familiar planchette. The arm is suspended from the ceiling in a sling and a pencil or pen attached to the sling writes the involuntary movements of the arm on smooth paper on the table below.



The Pneumograph. A little air cylinder, with ends of rubber, is bound around the chest of the person examined. A rubber tube leading thence to a pen writing on a moving surface, causes the pen to write the breathing movements on the paper.

WHEN Professor Hugo Munsterberg of Harvard university went to Boise, Idaho, to make certain observations of Harry Orchard, chief witness for the prosecution in the Haywood murder trial, the publicity arising therefrom caused the learned professor to make certain explanations to the public in an open letter. It was to the effect that he had not given to any newspaper details of the psychological experiments he made on Orchard, he would not until a much later period, and then only in scientific journals. What little he had said had been made the basis of sensational stories, false generally in their intent and content.

response by the suspect can be accurately measured. The paper may also be cross ruled in such a way that the character and extent of every movement can be minutely studied.

Mental conditions of no special emotion are accompanied by constant but slight involuntary muscular movements. A question or suggestion that in any way excites the suspect will be recorded on the chart either as a sudden change in the character of the movement or, if the suspect is wary, as a sudden stopping of the normal movement, due to his effort to appear unaffected. The character of the normal record and the way in which it varies with emotion may be seen in the accompanying illustrations. The questions or suggestions that produce emotion in a guilty person will, of course, have no such effect upon one who is innocent.

A considerably more delicate instrument is the pneumograph, which notes and records the normal breathing and any departures from it due to such causes as those already mentioned. Since the machinery of this instrument is almost entirely electric it is quite possible to have that portion which makes the record in an entirely different room from that in which the examination is being carried on. A sudden change in the rate or character of breathing is an almost invariable accompaniment of any sudden emotion, no matter whether the emotion is uncontrolled or an effort is made to control it, and, of course, as with the automograph, whatever

THE entire reading world had its attention attracted by the visit of Professor Hugo Munsterberg of Harvard university to Boise, Idaho, during the Haywood trial and the public awaits with interest his promised statement of the results of the scientific examination he gave Harry Orchard to determine whether or not he was telling the truth.

Concerning such examinations Professor Munsterberg has already said: "To deny that the experimental psychologist has possibilities of determining the 'truth telling powers' is as absurd as to deny that the chemical expert can find out whether there is arsenic in a stomach." If the results of his examination demonstrate a practical method of telling the truthfulness of a witness a new kind of expert may find a place in our courts.

Meanwhile inquiry among psychologists shows that the subject is not as new to them as it is to the public, experiments of the sort having been carried on for a number of years. The department of psychology at Columbia university, for example, has a whole series of sensitive electrical instruments for noting and recording the involuntary physical accompaniments of mental conditions or actions. If these were attached to a suspected person while he was undergoing a specially arranged examination they would indicate not only whether he was telling the truth but also something concerning the crime he was trying to conceal.

The simplest of these instruments, the automograph, holds the forearm and hand suspended in an easy position by means of a sling, which bears also a

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pencil or pen point, which records each involuntary movement of the hand, arm or body. This recording part of the apparatus can be hidden from the subject, and the sheet of paper upon which the record is made can be caused to move at a regular and fixed rate, so that the relation in time between any question or suggestion of the examiner and the

stimulates emotion on the part of a guilty person will have no effect upon one who is innocent.

Perhaps the most delicate of all these instruments is the sphygmograph, which on being attached to the wrist notes and records the heart beat in the same way that the others do involuntary muscular movement or breathing. Of the three kinds of

movement that of the heart is not only the most sensitive to emotion but is also least subject to control by the will. The record of its halts, jumps or rapid beating is perhaps the most significant of all.

Since all of these instruments may be attached to the same person at once, their accumulated testimony becomes very strong indeed. And when there

is employed in addition at the same time a purely mental examination, which is perhaps the strongest of all, the total weight of evidence can scarcely be doubted.

This purely mental test, which is based on the time measurement of mental associations, also employs electricity in the form of an instrument somewhat resembling a recording telephone. The facts of mental association are familiar to every one. Whenever two things have been experienced together one of them tends to call up the other in the mind, and the tendency for the one to recall the other increases in strength according as experiencing them has been recent or interesting or intense.

If now, for instance, a burglar has been committed and the suspects are to be examined by a psychologist he informs himself of all the striking details of the rooms that were entered and of the acts that must have been done—in short, of everything that would have attracted the attention of the burglar, and in particular of whatever things would have become associated in his mind. In the examination the psychologist, explaining that he wishes to test the subject's mental quickness, merely repeats long series of words, one after the other, and requires the suspect to pronounce as rapidly as possible

response, a suspect who is guilty will almost immediately utter the names of other things or actions connected with the crime, but which have not been mentioned by the examiner. In other words, he betrays the guilty knowledge of the scene of the crime or of the action which must have been gone through by the criminal.

Any suspicion on the part of the subject of the examination assists rather than interferes with its success. If he becomes aware that his answers are betraying him any refusal to proceed would be a practical admission of guilt and any hesitation in trying to avoid incriminating answers would make an equally significant sign on the time record.

Rapid answering to an associated word will not ordinarily occupy more than a second, but the realization of the danger of any association and the effort to find something else to say may require several seconds. The research for substitute words also is often unsuccessful. Sometimes, in spite of an effort to find another the incriminating word persists and the subject cannot avoid uttering it. At other times the rapid search leads only to nonsense, and this, if often repeated, is suspicious.

In any case, such an examination—especially if sufficiently extended to eliminate the results of accident or if combined with the three other forms of examination mentioned—furnishes almost unquestionable evidence of the action or the knowledge which the examiner seeks. And in every case there is an unmistakable difference between the response of a guilty or knowing person and one innocent or ignorant of the crime.

All of these methods may be used not only with suspects who wish to conceal their guilt, but equally well with witnesses who wish to convey an impression which did not accord with the facts, as may have been the case with Orchard. In the latter instance the lack of emotion or of unexpected association with the crime would be as significant as their presence in the examination of guilty persons.

The purely mental test described above, which was developed at the University of Wurzburg in 1905, is evidently that used by Professor Munsterberg with Orchard, although his experience and originality probably devised certain modifications or elaborations. He says: "The chief proof (i. e., of Orchard's reliability) lies for me in certain results of the time measurement of associations, a complex method which has been developed for legal purposes in the last two or three years."

Nor are the experiments described the only contributions that experimental psychology is likely to make to the solution of legal problems in the near future. Extensive studies of the credibility of the observation of even an intentionally truthful witness have been made at the universities of Berlin and Geneva and at Columbia, and they indicate that our ordinary observation is so far from accurate that no man can truly carry out the witness' promise "to tell the truth, the whole truth and nothing but the truth."

"Suppose a large number of persons observe a

given event. Let each one give his version and you find a great divergence of story. The amount of truth and of error, however, is fairly computable as a result of many experiments and proper provision can be made in certain circumstances for this margin of honest error.

But the details of this line of research, however, are, as Mr. Kipling says, another story.