

In a paragraph of not more than 100 words, say what are the various ways in which this machine can be used, and what are the objections to its use. (Article by Joseph Hanlon in *New Scientist*)

Lie detector

A new form of lie detector that works by voice analysis and which can be used without a subject's knowledge has been introduced in Britain. The unit is already widely employed by the police and private industry in the US, and some of its applications there raise serious worries about its potential here. The Dektor psychological stress analyser (PSE) is used by private industry for pre-employment screening, investigating thefts, and even periodic staff checks. Although at least 600 of the devices are used in the US, there are apparently only three in Britain. Burns International Security Services showed its PSE at the International Fire and Security Exhibition in London last week. Philip Hicks, assistant manager of Burns' Electron Division and the Burns official trained to use the PSE, said that one of the other two units was being employed by a private firm for pre-employment checks.

In addition to the normally understood voice generation mechanisms - vibrations of the vocal chords and resonance of cavities inside the head - there is a third component caused by vibration of the muscles inside the mouth and throat. Normally, but not under stress, these voluntary muscles vibrate at 8-12 Hz, and this adds a clearly noticeable frequency-modulated component to the voice. The PSE works by analysing this infrasonic FM component. Dektor claims that the muscle tightening occurs very quickly, and can change from one word to the next, so that it is possible to pick out a word or phrase that caused stress.

Dektor emphasises that the device shows only stress, not dishonesty. Three steps are suggested to overcome this difficulty. First, the subject is supposed to see a full list of the questions in advance. Second, there are 'neutral' questions and one to which the subject is specifically asked to lie. Third, if an individual shows stress on a vital question (such as Have you stolen more than £100 in the last six months?), then additional questions must be asked to ensure that this does not reflect an earlier theft or the subject's knowledge of someone else responsible.

The standard report recommended by Dektor is simply the statement 'After careful analysis, it is the opinion of this Examiner that the Subject's chart did contain specific reaction, indicative of deception, to the relevant questions listed below.' And Hicks admitted that if a person showed stress and Hicks was unable to ascertain just what caused the stress, he would assume that the stress was 'indicative of deception'.

In the US, the device is used for pre-employment interviews, with questions such as 'Have you used marihuana?' and for monthly checks with branch managers, asking questions like 'Do you suspect any present employees of cheating the company?' - which at least prevents a manager from setting his own pace to investigate possibly suspicious behaviour. Finally, US insurance investigators are now using the PSE. They need not carry it with them - only tape record the interview, usually with the permission of the unsuspecting claimant. Not only does an assessor go through the claim form to look for false claims (a questionable practice, because a person is just as likely to stress over being reminded of a lost or damaged object as to lying), but he also offers less money than requested. The claimant's response can, apparently, be analysed to show if he is, in fact, likely to eventually accept.

The potential application of the PSE in Britain is extremely disquieting, especially as there seems no law to prevent its use. The most serious problem is that its primary application will be in situations where people may not object - such as pre-employment interviews. But it can also be used to probe a whole range of personal issues totally unrelated to job - union and political affiliations, for example. And, of course, the PSE can be used without the subject even knowing; its inventors analysed the televised Watergate hearings and told the press who they thought was lying. Finally, the device is not foolproof but depends on the skill of the investigator, who receives only a one-week course from Dektor.

In the US, where lie detectors of all sorts are much more widely used, Senator Sam J. Ervin has introduced a bill to virtually prohibit their use by private companies. There may be a privacy bill from the UK government this summer, and hopefully it will include the use of lie detectors. In the interim, trade unions and consumer groups should prevent their use before they become widespread.