



National Lie Detection Laboratory

### OLD LIE DETECTOR

**Electrocardiogram.** Using heavily shielded electronic equipment, it might be possible to detect heart action a few millimeters away from the skin surface.

### Ordinary Office Chair?

A device that demonstrates the feasibility of an indirect heart rate monitoring instrument, an upright ballistocardiograph, has been built and tested by two scientists from General Motors Corporation while they were at Santa Barbara, Calif. The chair, which looks like an ordinary office chair, is now being used for tests at the Space/Defense Corporation, Birmingham, Mich.

A very sensitive piezoelectric accelerometer and a vibratory system are mounted in the chair. When an individual is seated in the chair, the forces exerted by the pumping action of his heart are sensed, changed from mechanical to electrical energy, then broadcast to remote recording instruments. An individual weighing less than 140 pounds will not generate a satisfactory signal.

Since the chair so closely resembles an ordinary chair, the heart data can be obtained without the conscious knowledge of the subject.

Another chair has been successfully tested in experiments at Syracuse University, Syracuse, N.Y. It takes an electrocardiogram indirectly by detecting the circulating electric current produced by heart action potentials.

Some or all of the six kinds of instruments would be necessary to conduct lie detection at a distance. When used remotely, responses of those undergoing tests would be much less inhibited. However, doing such tests without a person's knowledge ignores the moral question of whether they should be made without the subject's consent.

### Value in Diplomatic Negotiations

These devices would also have possible application for the following:

1. Court procedures. Judges and juries now use certain reactions of a witness, such as his speaking rate or the flushing of his

face, to make a judgment as to whether the witness is telling the truth. Such judgments would be based on more information and less biased guesses if instruments were used to measure the changes.

2. In diplomacy. The installation of such equipment in diplomatic offices and at international conferences might do much to encourage truthfulness on the part of the participants, Dr. Berkley said. At the very least the instruments should make statements of policy, which are part of the political line of a particular country, much more readily appreciated at their true values.

3. In espionage and surveillance. The availability of such equipment might reduce the need for installation of "black boxes" to detect nuclear blasts. It might be sufficient merely to examine a number of the representatives of the countries involved with or without their consent using the new techniques.

Dr. Berkley suggested that the United Nations would be one of the prime prospects for the development and purchase of such equipment. In political debate, he said, "certainly every forum should be equipped with one of these devices."

4. The art of electronic eavesdropping. The recording of conversation at a distance might be possible by a modification of the radar used to measure changes in respiration. Electronic eavesdropping, exemplified by a device called the "big ear," has already reached a high level of perfection.

• Science News Letter, 88:106 August 14, 1965

### Electron Beam Welder To Aid Astronauts

► THE DEVELOPMENT of a hand-held, electron beam welder that works in a vacuum is expected to play an important role in giving astronauts the proper tools for construction and repair work in outer space.

The welder is to join metals by firing a highly concentrated beam of electrons traveling 50,000 miles per second. The portable part of the welder—a cylinder housing the electron gun, its electromagnetic focusing lens and a transparent shield through which the welding can be observed—will be five inches in diameter, ten inches long and will weight ten pounds. It is being developed by the Hamilton Standard Division of United Aircraft Corporation.

• Science News Letter, 88:107 August 14, 1965

### ENGINEERING

### Oil-Wax Layer Saves Water from Evaporation

► SPREADING OIL on troubled waters may smooth them, but spreading an oil-wax layer on fresh water keeps it from evaporating in storage tanks and facilities, reports R. C. Fox of Richmond Laboratory, California Research Corporation, Richmond.

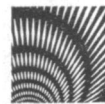
A layer of this petroleum-oil-wax floats more easily over the water surface than a layer of fatty alcohol, which has sometimes been used to retard evaporation, Mr. Fox reported in *Nature*, 205:1004, 1965.

The oil-wax layer also reforms more easily after being distributed, is biologically more inactive and is less expensive. Further investigations of this system are underway.

• Science News Letter, 88:107 August 14, 1965

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