

renewable and convertible insurance contract. The guaranteed insurability clause (without medical) of this type of term insurance provides the same protection as that offered by standard insurance.

Mr. Babin's calculations reveal that the yield on life insurance savings is relatively low. Three types of standard insurance policy are considered: participating policies, which yield dividends; non-participating policies, which do not; and endowment policies, which specify a date when their cash surrender value, which is the return on savings, will reach their face value. At best, participating policies offer a rate of return of approximately 5.5 per cent. Endowment policies rank second with a yield of about 4.6 per cent and non-participating policies offer the least return — about 4.1 per cent. In addition to these low yields, investment in standard life insurance appears to carry a number of risks.

#### Main asset uncertain

One of the main assets of a standard insurance policy is its cash surrender value — that is, the return on the savings element as opposed to the face value of the contract. This can be voluntarily withdrawn at any time during the policy, thus effectively terminating the contract. However, should the contract be ended because of death, the cash surrender value is reduced to zero. Therefore, its value as an asset is uncertain, depending on the probability that the insured will survive.

A further source of uncertainty comes from the fact that rates of return are dependent on the length of the assumed holding period. The yield could even be negative if the policy-holder withdraws in the early years of the contract. In the 20-year contracts studied, termination after the third year would yield an average rate of return ranging from -68.2 per cent on a non-participating policy to -17.4 per cent on endowment insurance. A minimum of seven years was necessary before the return became positive. The maximum yield could generally be obtained only by holding the policies to maturity.

Life insurance policies do offer an advantage in terms of liquidity. The insured can borrow up to 90 or 95 per cent of the accumulated cash value of

his contract at generally favourable interest rates. However, during the early years of the policy, only part of the net level premium reserve is held for this purpose; the rest of the premiums he has paid go to the insurance agent as commission. Therefore, in the first few years of this contract, the insured can borrow only on a portion of his investment.

Given the interest rates available

on other financial assets, the low yield and the uncertainties associated with standard life insurance policies make them a relatively poor investment. Although the figures upon which this research is based are from 1973 and are likely to have improved since then, Mr. Babin maintains that correspondingly higher interest rates make this conclusion equally as applicable in 1976.

#### Seeing with sound

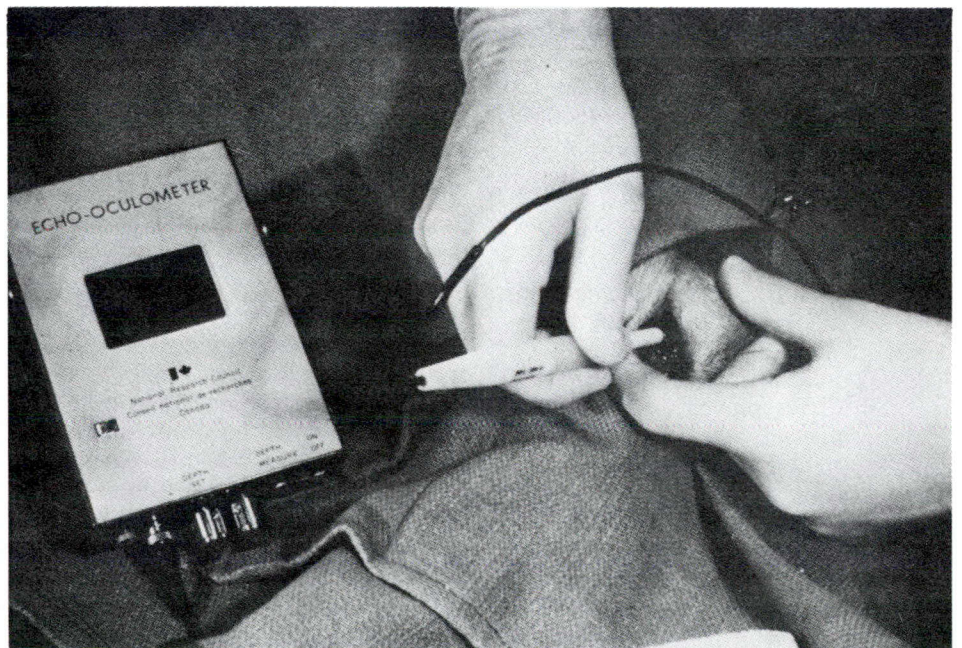
"With the aid of ultrasonics, we have opened the door to the surgical implantation of a prescription lens into the human eye," says Alan Mortimer of the National Research Council of Canada. "Using the Echo-oculometer, it is relatively simple to take accurate measurements of the eye within minutes."

Mr. Mortimer, of the Medical Engineering Section, is concerned with the application of ultrasound in the field of medicine. But what is ultrasound? "It is simply that sound which lies above the range of human hearing," Mr. Mortimer answers. "Since the healthy human ear can hear sounds up to a frequency of 20,000 hertz (cycles per second), the science of ultrasonics deals with sounds lying above that frequency. In the research we are carrying out in this laboratory, we use sound at millions of cycles

per second."

While light travels in straight lines and leaves sharp shadows of objects placed in its path, sound can be heard around corners and bulky objects. But what happens if sound of very small wavelengths is used, that is, sound which falls in the ultrasonic range? Such sound moves only in straight lines and leaves sharp shadows around interposed objects. Indeed, it is possible to use ultrasound as one uses light to take pictures of an object and measure distances. Since ultrasound of the appropriate frequency passes through the human body, it makes it possible to "see" internal organs. In the field of obstetrics, where the use of X-rays is hazardous, ultrasonic pictures of the fetus are particularly valuable.

In the replacement of a diseased lens by an artificial one, it is important, for the restoration of proper vision, that the implanted lens be



The probe tip is applied to the eye and axial length read from the machine.