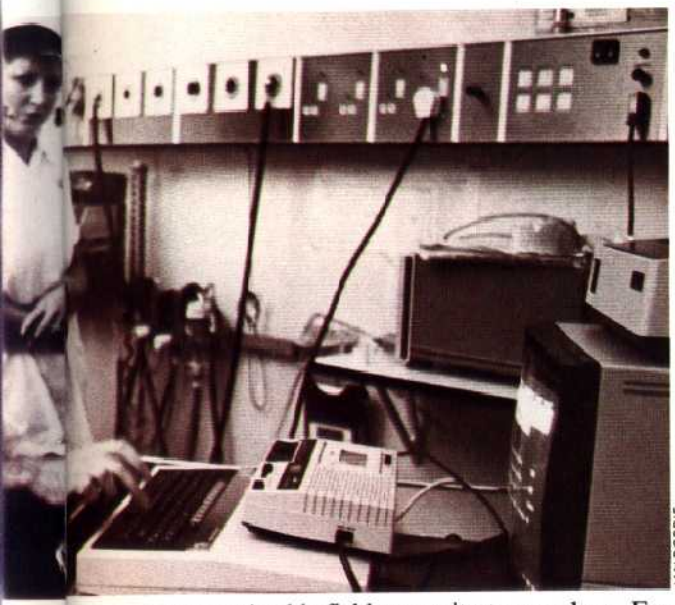
offer include some that you perhaps wouldn't consider immediately — security of information, perhaps. It is much more difficult to read a file that is contained on a floppy disk than it is from paper — even assuming that you know how to operate the computer system!

But by far the most significant advances have come in the area of diagnostics. Until recently, the only methods available for internal examination were at best dangerous and at worst downright destructive: X-ray photography, with the attendant possibility of excessive exposure to radiation; endoscopy — the insertion through an orifice of a viewing tube — which could cause trauma to the fragile internal tissues; and exploratory operative surgery.

The development of computerised tomographic (CT) techniques, which utilise a thin scanning beam of X-rays, rather than exposing parts of the body to blanket radiation, are one significant advance both in accuracy and safety. The use of alternative media, such as ultrasonics and nuclear magnetic resonance, holds out the possibility of a completely harmless way for making internal examinations.

Medical emergency systems, too, benefit from computerisation. It is unlikely, for example, that the organ transplant programme in Britain would be as advanced as it was without the benefits of computerised database methods.

Another spectacular advance has been in the treatment of both the physically and mentally handicapped. While still in its infancy, potential



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advances in this field are quite tremendous. For example, imagine the joy of a mute paraplegic at being able to 'speak' for the first time, via an eye-following input device and speech-synthesising output.

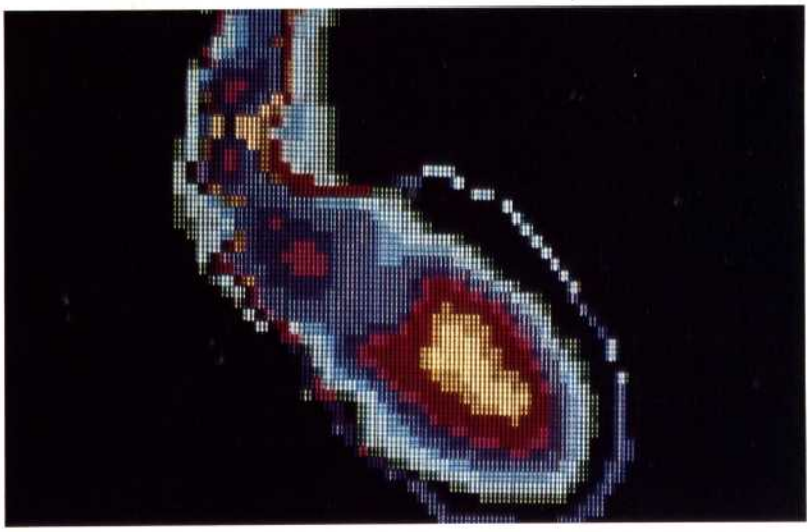
Eye following devices measure the movement the eyeball makes as it scans along a line. From a reference point, it is possible to infer the current position, and hence the character being read.

Speech synthesiser chips contain in ROM the 'building bricks' of speech, called phonemes. Individual phonemes are strung together under program control to make words.

If a severely handicapped person has any degree of movement at all, it can be exploited to form the basis of a computerised communications system. The most popular approach is to replace the standard keyboard with a custom-built unit. It can have very large keys, for example, a benefit to multiple sclerosis and locomotor ataxy sufferers, who have difficulty in locating objects. Or perhaps it could be built to require no pressure.

Alternatively, the machine can present the user with a pre-determined range of prompts at a set rate, for example, a menu for the user's next meal. By pressing a switch at the appropriate point the user tells the computer what he wants to eat. The computer assumes a negative answer if there is no response. In this case the 'keyboard' will be no more than a single switch, accessible by means, perhaps, of a movement of the whole head.

At the least inventive, this approach enables the user to use a word processing package, albeit slowly, and thus produce written work — a tremendous advance for spastics or thalidomide victims.



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Safer By Far
Nuclear magnetic resonance scans, like the one shown here, produce similar results to computerised tomography scans, but because they do not use X-rays are considerably safer. At the moment, the technique is in the experimental stage. Each scan can take up to an hour

A Picture Of Health
Information on the patient's condition, obtained by sensors attached to the body, is interpreted by a microprocessor, and is then displayed on a specially modified oscilloscope, similar to those used by electronics engineers