

such, including portraits, but can *index* only a few of these, viz., fingerprints (replacing the earlier Bertillon measurements), and MO (*modus operandi*), aside from indexes of address and telephone, used for other purposes chiefly, and the marks of laundries and dry cleaners. Indexing multiplies the value of records several fold, since it enables identifying the individual and locating all his records, given a single later observation of him, such as fingerprint, or an account (MO) of a new crime. It would be an immense help to law enforcement, and so to all of us, if we could invent ways to *index* faces, ears, handwritings, and voices, now increasingly recorded by cameras and acoustical devices. The telephone company has made a start toward indexing voices. It does not seem too much to ask, that whatever the unaided human mind can perceive, remember and recognize as unique, the mind aided by scientific measurement and recording, should be able so to catalog and index, that another mind later meeting the same should be able to seek out, look up, and identify the individual, just as with fingerprints.

[348] In the same field of police, and also of mental health, lie many other nascent inventions needing more vigorous development, especially lie detection techniques, and mental and psychoanalytic tests, including graphology. This latest science, of reading character and personal history from handwriting, has proved its power, and while it is not, of course, the *best* way to read those traits, it is often the only way available, or the only easy one, as when a vanished criminal has left some writing, or an unknown letter-writer asks credit. As for lie detection, it gives promise of becoming able to read the mind, willy-nilly, completely. Possibilities of abuse? Of course, and possibilities of proper administration too, and of great benefits, including the proof of innocence and good character.

3. CYBERNETIC INVENTIONS

[349] Science finds commercial support only in minor degree in even most recent times; it depends chiefly upon government and on universities and other philanthropies. A great new field for interlocked science and invention, one supplying the ideas and the other the devices to utilize them may be called Cybernetics, or the science-craft of perceiving things and acting accordingly. The human senses, mind, memory, and hands are to be understood, imitated, supplemented, improved, and partly replaced, not only through invention but through physiologic study of the mind and nervous system of man and other animals. Such studies, and the new Communication Theory, have been involved with others, in inventions previously discussed, for television and other communication, documentation, automated libraries, indexing personal traits, and synthetic music. The vast and fast growing field of Automation, with its devices for measuring, recording, and controlling, is likewise involved. A great new light begins to be shed by the electroencephalograph and similar measurement of electric potentials of nerve impulses—means of following and measuring the mind as it thinks and acts.

[350] Inventions to enable the blind, deaf, and crippled to overcome their handicaps are some minor fields for cybernetics, and should have noncommercial support, since we believe that society owes help