they have an ill opinion will act from corresponding motives. It requires positive evidence to overthrow the influence of the working hypothesis.

The method of multiple hypotheses assumes broadly that the acts of a fellow-being may be diverse in their nature, their moves, their purposes, and hence in their whole moral character; that they may be good though the dominant character be bad; that they may be bad though the dominant character be good; that they may be partly good and partly bad, as is the fact in the greater number of the complex activities of a human being. Under the method of multiple hypotheses, it is the first effort of the mind to see truly what the act is, unbeclouded by the presumption that this or that has been done because it accords with our ruling theory or our working hypothesis. Assuming that acts of similar general aspect may readily take any one of several different phases, the mind is freer to see accurately what has actually been done. So, again, in our interpretations of motives and purposes, the method assumes that these may have been any one of many, and the first duty is to ascertain which of possible motives and purposes actually prompted this individual action. Going with this effort there is a predisposition to balance all evidence fairly, and to accept that interpretation to which the weight of evidence inclines, not that which simply fits our working hypothesis or our dominant theory. The outcome, therefore, is better and truer observation and juster and more righteous interpretation.

### Imperfections of Knowledge

There is a third result of great importance. The imperfections of our knowledge are more likely to be detected, for there will be less confidence in its completeness in proportion as there is a broad comprehension of the possibilities of varied action, under similar circumstances and with similar appearances. So, also, the imperfections of evidence as to the motives and purposes inspiring the action will become more discernible in proportion to the fulness of our conception of what the evidence should be to distinguish between action from the one or the other of possible motives. The necessary result will be a less disposition to reach conclusions upon imperfect grounds. So, also, there will be a less inclination to misapply evidence; for, several constructions being definitely in mind, the indices of the one motive are less liable to be mistaken for the indices of another.

The total outcome is greater care in ascertaining the facts, and greater discrimination and caution in drawing conclusions. I am confident, therefore, that the general application of this method to the affairs of social and civic life would go far to remove those misunderstandings, misjudgments, and misrepresentations which constitute so pervasive an evil in our social and our political atmospheres, the source of immeasurable suffering to the best and most sensitive souls. The misobservations, the misstatements, the misinterpretations, of life may cause less gross suffering than some other evils; but they, being more universal and more subtle, pain. The remedy lies, indeed, partly in charity, but more largely in correct intellectual habits, in a predominant, ever-present disposition to see things as they are, and to judge them in the full light of an unbiased weighing of evidence applied to all possible constructions, accompanied by a withholding of judgment when the evidence is insufficient to justify conclusions.

I believe that one of the greatest moral reforms that lies immediately before us consists in the general introduction into social and civic life of that habit of mental procedure which is known in investigation as the method of multiple working hypotheses.

# Education as a Way of Life

Traditional arrangements for education must be supplemented by a system designed for lifelong learning.

John W. Gardner

Nothing is more obsolete than the notion that education is something that takes place in a solid block of years between, roughly, ages 6 and 22. From now on, the individual is going to have to seek formal instruction at many points throughout his career.

Under such a system, much of the present anxiety over young people who quit school prematurely will disappear. The anxiety stems from the fact that today leaving school signifies the end of education. Under the new system there will be no end to education.

Unfortunately, our institutional arrangements for lifelong education are ridiculously inadequate. Most educational institutions are still designed for young people who have nothing else to do. They are ill suited to men and women who must fit their learning into a busy life.

For years a small number of devoted educators have sought to meet the needs of this latter group, but they have not received much cooperation from the rest of the academic world. That state of affairs appears to be changing.

In the making now are some highly flexible arrangements to make education available to anyone able and willing to learn, under circumstances suited to his needs. To indicate in concrete terms what such a system might look like, I am going to describe certain activities of an imaginary university—let us call it Midland State University. (It is not necessary that all these activities be sponsored by a university—a point which I discuss later.)

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Some of the activities I describe are already being carried on by one or another university. Others have not gone beyond the discussion state.

The simplest way of getting into the story is to let you see some of the students of Midland State at work.

Fred O'Brien, age 19, is a truck driver. He made good grades in high school but was never interested in going to college. During the past year he began to realize what education could do for him and decided that he'd like to become a chemical engineer. At the moment—it is 9:00 p.m.—he is reviewing elementary chemistry on a self-teaching device (misleadingly called a teaching machine) that Midland State has placed in his local public library.

At 3:00 p.m. on Mondays, Wednesdays, and Fridays, George Junker, age 40, winds up his normal job activities and spends the remainder of his working day studying electronics. His firm, an optical concern, recently entered the electronics field and has contracted with Midland State to provide a course for its employees. The purpose is not to produce electronics specialists but to give the firm's highly qualified optical technicians a general familiarity with the company's new field of activity. It is not a college credit course.

It is 11:15 on a weekday morning and Miriam Kalman has her home TV set tuned in on a Midland State educational broadcast. Her 1-year-old son is asleep in the playpen at her feet as she sits taking notes on the broadcast. The course, which she is taking for college credit, is English literature—her major before she interrupted her college career to get married.

Albert and Jane Mayer are meeting at the Women's Club for their weekly class on Oriental civilizations. Mayer is a retired lawyer, and for a good many years he and his wife have taken at least one evening class a week. Both enjoy reading, and they tend to choose courses with fairly heavy reading requirements. The class is taught by a young professor from a nearby college. Although the professor holds no appointment at Midland State University, he has been certified by Midland State for instructing such informal groups. Each member of the group chips in to pay his weekly fee.

Kalu Ofubu, a resident of Lagos, Nigeria, received his A.B. degree from Midland State 2 years ago. Like most educated Nigerians he found himself in a responsible public post at a fairly early age. Through Midland's extensive correspondence courses, he has continued his studies. An undergraduate major in agricultural sciences, he is presently studying economics.

It is the first Monday in the month, the day on which Midland State offers examinations for credit to any and all students who apply. Joseph Scanlon, age 20, has appeared to take an examination in Russian. As an enlisted man in the U.S. Marine Corps, he found himself assigned to the U.S. Embassy in Moscow, and he set about learning the language and studying Russian literature. He now hopes to gain college credit for his efforts.

So much for examples.

*Credit by examination.* The secret of the great flexibility of Midland State's operations is the system of credit by examination. This is not a new thing in American higher education, and it has a long and honorable record in other countries. The virtue of the system is that it permits great diversity in the circumstances under which learning takes place, and yet retains disciplined control over the evaluation of whether the student has in fact learned anything.

In many subjects the examinations are standardized objective examinations. In others essay examinations are the rule. In a few subjects, usually at an advanced level, oral examinations are used. Scores are based on the performance of students at 40 leading universities. In short, the examinations are not an easy back door to education.

*Television.* Midland has three stations in various parts of the state, but also does some of its programs by arrangement with commercial stations. It has a variety of closed-circuit arrangements with public schools and adult-education centers throughout the state. It has rejected the assumption so common in early educational TV that all one needed was a camera and a willing professor. It treats the production of a first-class course on video tape as the complex enterprise that it is, involving the finest scholar-teachers in collaboration with experts in TV production. If the course calls for laboratory demonstrations that do not exist, time is taken to design them. If it calls for shots of the cathedral at Chartres that aren't available in any film library, the shots are obtained *de novo*. Since no one university could afford such an expensive venture, Midland shares production facilities with a consortium of major universities. The completed tapes are made available on rental to any educational institution that may want them. And in turn Midland draws on the growing resources of video tapes in other institutions. The University expects that eventually its programs will far outstrip all but the best of conventional college teaching performances.

*Correspondence study.* Just as Midland State has made a radical break with early educational TV practices, so it has completely overhauled correspondence study. Its correspondence courses are the product of some of the best minds in the academic world and meet the highest standards of pedagogical quality. Because the creation of such courses is arduous and expensive, Midland makes only a few of its own. It shares those it makes with all other universities. In return it borrows from the common pool. Only a minority of the courses are straight correspondence study in the traditional pattern. Some of the best of the new courses are coordinated with the television courses offered by the University. Many of the courses make use of programmed instruction.

*Self-teaching devices.* The University supplies programmed instruction materials at cost to any library, school, church, lodge, union, or industrial establishment in the state that can demonstrate its serious educational intention. As with television and correspondence study, Midland State produces only a small fraction of the programmed materials that it uses. It borrows the rest from other universities in order to make available to its students the best materials in the country.

*Libraries.* Libraries throughout the state play an important role in the University's activities. Some libraries have developed language laboratories. Some have programmed instructional materials. Many have listening rooms for recorded music, poetry, and plays, as well as viewing rooms for educational and documentary films. All of these are regarded by the University as vital links in the network of community education. On its part, the library will seek to have available every book recommended for reading in these programs, and multiple copies of the more important books. Where very heavy use of particular books is required it may have special paperback editions available. The University will also make use of traveling libraries and laboratories to reach remote or sparsely populated areas of the state.

*Group study.* The liveliest and by all odds the most popular part of Midland State's off-campus program is the provision for group study. Solitary study does not appeal to everyone. And some kinds of education need the give and take that a group provides. The only novel aspect of the Midland group-study program is its extraordi-

nary flexibility. Classes may be organized by any organization or institution that can persuade Midland of its serious intentions—and the University is liberal in its judgments. Thus classes are organized by corporations, by church groups, by the Boy Scouts, by unions, by professional societies, and by fraternities. All the sponsoring organization need do is bring together enough interested individuals so that between them they can make up the teacher's fee. They can meet anywhere —in a local school, in the firehouse, in the home of a member. Having selected the subject they wish to study, they write to the University for a list of certified instructors. These instructors may be faculty members in local colleges, teachers in the public schools, or professional men in the community, as well as professors sent out from the University. The University provides a syllabus with suggested readings, and this may be fairly important if the students are working for college credit, since it will cover the ground on which the examination is based. But if the group wishes to depart from the syllabus it may do so. It may proceed at its own pace. In general, the University assumes that adults are adults, and that although they need help in creating learning situations they do not need nurses. The points at which the University exercises quality control are (i) certification of the instructor, (ii) provision of the syllabus, and (iii) the examination for credit. If the group and the instructor decide to ignore the syllabus and explore some interesting intellectual bypath, the University doesn't care one way or the other. If as a consequence they all flunk the examination, that is all right too.

The University also encourages informal groups to meet in homes or elsewhere to work on television and correspondence courses. The commitment to sustained study is thus reinforced, and it is more fun.

### The Future of Universities

Of course, emergence of continuing education as a way of life will require changes in many other areas of our society. Perhaps the most striking change will have to occur in the attitudes of employers toward such education. Employers are going to have to assume that continuing education is a part of *every* career and that allowance should be made for it in the form of paid leaves-of-absence, sabbaticals, refresher courses during working hours, and so forth. In the meantime, the shorter work week and longer vacations are already providing considerable time for study.

But university people are less concerned with such far-reaching changes than they are with the consequences for the university itself. What will become of the more conventional activities of Midland State? Will it continue to have a campus? What will go on there? The answer is that it does have a campus, and the traditional life of the University goes on as it always has. Students live in dormitories, attend lectures, play on athletic teams, and enjoy all the excitement and wonder of undergraduate life. The graduate school and the great professional schools carry on as usual.

But, even though the traditional core of Midland State's activities remains intact, many readers may react to the description of far-flung new programs with something approaching horror. They will point out that the universities are already staggering under extraordinary burdens heaped on them by society—vast research programs, unprecedented enrollments, heavy extracurricular commitments for faculty members, and so on. Why burden them with heavy additional responsibilities?

It is a fair question. Perhaps the major efforts in continuing education should *not* be organized around the universities. But the job is going to have to be done by someone. Certainly the public schools must play a part. The basic fact is that our complex, fast-moving society *must* accomplish such continuing education somehow. If the universities appear to be the best means, then the society must provide them with adequate resources to do the job.

Some universities now believe that sponsorship of lively and effective off-campus education may in the long run reduce the pressures on the campus itself. They argue that the university can no longer hope to welcome to its campus all of the vast number of students seeking college education and must, in self-defense, learn to serve many of them off campus.

But there is another reason why the university should have a significant role in a dispersed system of continuing education. Large-scale efforts to serve all kinds of people with all kinds of educational fare through a great variety of channels could easily become diluted, superficial, formula ridden, and lacking in standards. Continuing education needs the kind of intellectual stimulus, discipline, and standards that the university can provide. A link with the universities can keep the whole system vital and effective.