

ALFRED WATSON MEMORIAL LECTURE

MANAGEMENT IN INDUSTRY AS A CAREER FOR THE
ACTUARY: PROSPECTS AND DIFFICULTIES

THE following is the full text of the third Alfred Watson Memorial Lecture which was delivered on 25 April 1949 by **Mr E. H. Lever, F.I.A.**

WHEN I was asked by the President to deliver one of the Alfred Watson Memorial Lectures I hesitated very much before accepting. I first doubted whether it was appropriate that such a lecture should be delivered by one who was himself a Fellow of the Institute, and I further doubted whether I should be able to find time to prepare a lecture which would maintain the high standard set by my predecessors. I accepted eventually because the President convinced me that having left the recognized fields of actuarial practice to occupy a high administrative post in the industrial world, I was able to view the profession from a somewhat unusual vantage point for an actuary, and because I felt that, arising out of this, I had a definite and, I hope, helpful message to convey to the Institute. I overcame my scruples with regard to the quality of the lecture itself by reflecting that it was the message that mattered rather than the words in which it was conveyed, and that if I had anything to say I should seize this opportunity to say it.

I want to make it quite clear, however, that my remarks will have little or no appeal to those who take a narrow view of the scope of the profession, if there be any such, and who regard it as being in effect limited to the training of men and women in those technical skills which have enabled life assurance to be converted from a gamble into a stable and profitable business. My remarks are directed mainly to those of you who are enterprising enough to be looking for fresh worlds to conquer, and who are imaginative enough to see in the quality of mind which leads a man or woman to desire to become an actuary in the first instance, and in the development of this quality of mind which actuarial training ensures, a powerful attribute which, if properly and adequately applied, is capable of solving problems in fields previously considered to be quite outside the ken of the actuary, and which qualifies him to exercise functions beyond those for which he was specifically trained.

I make no apology for this preamble, since it was the expressed intention of the donor, whose gift to the Institute made these lectures possible, that his gift should be used to advance the interests of the younger members of the profession.

I have prepared this lecture with this objective in mind, and I feel that the most helpful contribution that I can make towards it is first to paint a picture of the actuarial profession as it appears to those outside its ranks—a rather depressing picture I am afraid—and then, out of the lessons to be learned therefrom, to draw hope and inspiration for the future.

Those of you who have ventured into the realms of philosophy and metaphysics, and there must be many such among actuaries, will be familiar with the fundamental difficulty which faces all such seekers after truth, namely, that of adequately appreciating and describing a system of which the observer himself forms a part. In logical terms the difficulty is that of establishing an unalloyed subject-object relationship.

The actuarial profession has perforce been faced with this type of difficulty since its inception. However searching its self-analysis and however honest and seemingly objective its approach, it is inherent in the nature of the case that in any assessment of itself as a body it lacks adequate appreciation of one vital factor, namely, the impact of the knowledge and of the actions of actuaries upon the surrounding world of non-actuaries. This remains true in spite of the opportunities of assessing this factor which are to a limited extent open to certain of our members, such as actuaries working in composite offices or actuaries engaged mainly on the financial and investment side of insurance institutions.

This point is, in my view, very important, so important that the profession will fail to render its maximum service to society unless, in addition to perfecting its techniques and adequately training a selected few in their use, it solves the problem of how most effectively to secure that its members have access to adequate opportunities of giving full rein to their talents.

It is quite true that we have many times reviewed our objectives and methods and only very recently an Examination Sub-Committee, of which I had the honour to be Chairman, exhaustively surveyed the whole field of recruitment, training and purpose and made recommendations which the Council is carrying out. But even in the course of the discussions of that Committee—which were many, uninhibited and prolonged—I had the feeling that our proceedings suffered from inadequate knowledge and appreciation of those external reactions to us to which I have referred.

If our profession is to achieve and to maintain its optimum usefulness it must, in my view, play an even more important part in the scheme of things than it is at present playing, and I take for granted that the majority of those present tonight will support me in this. I am reinforced in this assumption of support by the broad agreement reached by the Examination Sub-Committee that the proposed revision of the prospectus and of the ancillary training would fail in its object unless the newly qualified actuary emerged from his studies ‘stimulated by his course of training and examination and not exhausted by a long drawn-out struggle; alive and alert enough to wish to contribute by his further studies to the vitality of the profession and still young enough to be ready to seek his career in any field open to the newly qualified Fellow’.

There is still much to be done before these objectives are fully achieved, both in relation to training and examination and in relation to the scope of an actuary’s activities after qualification, and it is in the latter connexion that I feel that I can do something to help those upon whose shoulders falls the burden of guiding the fortunes of our profession.

Many actuaries have proved themselves skilled administrators and have shown a flair for handling economic and industrial problems of every kind, but for the most part as an adjunct to, and not independently of, the exercise of their professional duties or occupations closely related thereto.

There are very few, if any, who can claim, as I can, to have intimate knowledge of, and practical experience in, so remote and so vast a field as industrial organization and management. Situated as I am, therefore, in entirely non-actuarial surroundings, I am better qualified than most to give you a picture of how the profession looks to those completely outside its ranks. I admit that I can only give you the facts as I have learned them from my own experience. I claim no more validity for my picture than that.

My first comment may give you a mild shock, namely, that when I left the traditional fields of actuarial activity about nine years ago I found that, in the

territory that I had invaded, the mere holding of the Institute's Diploma counted for little or nothing.

My new colleagues could be divided broadly into two categories. The first category consisted of those who neither knew nor were particularly interested in how the actuary was trained or what he did. Those who did bother quite genuinely believed that the profession indulged in some kind of occult practices—which in any case were of limited use—and while conceding that great ability was required to master actuarial science and art they could see very little connexion between them and the manifold practical problems of life.

It may well be asked why in that case I myself, being an actuary, was requested to take on a job of some importance in the industrial world. It was certainly not because I was entitled to put the letters F.I.A. after my name. It must have been because I had already achieved some success in non-actuarial fields, and though I myself knew, none better, how much I owed such success as I had already achieved to the training I received as an actuary, it has taken me a long time to convince others of this fact. In other words, we have the paradoxical situation that, although ability to deal with practical problems of administration can have its roots, as in my case, in actuarial training, possession of the diploma, through ignorance of its connotation, can be a handicap rather than a help in securing positions of high executive responsibility outside our ranks.

This reluctance to think of the actuary as an administrator, in spite of the proved administrative capacity of some members of the Institute, doubtless receives reinforcement from the relatively low percentage of chief administrative posts held by actuaries in the very field of activity which gave rise to the existence of the profession, namely the business of life assurance.

It is certainly a little disconcerting that only about 40% of the insurance companies in Great Britain which actively transact life assurance business have an actuary as general manager or chief executive officer, and that even in the case of purely life offices, where one would expect all such posts to be held by actuaries, 30% of the chief executive officers are not Fellows of the Institute or of the Faculty. If purely life offices are excluded, the proportion of chief executive officers of life assurance companies who are actuaries is as low as 18%, and this figure becomes even lower if collecting friendly societies and assurance institutions with restricted activities are taken into account. I submit that these are significant figures which should give us much food for thought.

It may be too much to hope that those who are looking for administrators and leaders in any field look first to the ranks of the actuarial profession, but I submit that at least the possibility of finding administrators within our ranks should be more fully recognized, not only by those in the insurance world but by the public generally.

Some evidence that this possibility is not yet in the minds of the general public is contained in the fact that, in the arrangements currently being made for the May Conference of the British Institute of Management, eighteen professional bodies are listed as being interested in management, but the Institute of Actuaries is not among them. The list, on the other hand, includes all the main accountancy and secretarial institutions and such bodies as the Institution of Electrical Engineers and the Institution of Mechanical Engineers.

So much for the first category of my new colleagues.

The second category consisted of those who regarded the actuary as nothing more than a particular brand of statistician and this, I submit, is largely the Institute's own fault. In our search for methods of extending the scope of the

profession a great deal has been done both inside and outside our ranks to explain to the world that the actuary can do all that a statistician does. The danger, as I see it, is that we shall end up by convincing everybody that the actuary can do no more than the statistician does. Along this road the profession, in my view, will march towards atrophy and eventual death.

Previous lecturers have given ample evidence of the deep and growing recognition of the vital necessity for skilled statistical analysis over a wide range of activities, but grave danger lies in too great an emphasis on this aspect of our work since, in the outside world, a statistician is normally regarded as a man whose functions are restricted to providing the administrator with the tools for his job, and I contend that this is too limiting a conception as far as the actuary is concerned. I contend that, allied to personality and character—and these qualities must be present in any event—the cast of mind with which the actuary emerges from his training is, or should be, such as to qualify him for success in the actual job of administration.

I am very concerned about this growing tendency both within and without the profession to identify the actuary with the statistician. It is true that in our recommendations for the new syllabus we suggested that more advanced statistics might be one of the subjects selected as a basis for 'specialized emphasis', but this was simply to cater for those of our number who have a flair in this direction and who wish to specialize in this field; it was never intended to be a limiting factor.

I hope that it will not be inferred from anything that I have said that I hold statisticians and statistics in other than the highest esteem. Quite the contrary. I know, none better, that they have a vital part to play in our modern social and economic structure. Statistics, however, like fire, can be a good servant, but a bad master, and their use must be restricted rigidly to the purposes which they are designed to serve.

In the fields of industrial and business administration, indeed in any field in which the administrator has to show a financial profit on balance, there is little danger of the statistical side getting out of hand since the nature and extent of the information collected and the form of its presentation can be controlled by the chief executive himself, but in the present bureaucracy-ridden world masses of statistics are being collected which are much less under control.

These statistics are for the most part demanded by two main classes of bureaucrats, whom we may style the 'planners' and the 'controllers'; and first-hand experience convinces me that, in the collection and in the dissemination of the information so demanded, a tendency is manifesting itself which, if left unchecked, will not only bring statisticians and statistical methods into disrepute but may well lead to the misdirection of the economy of the country.

This is a sweeping statement. You are entitled to expect me to justify it, and even if it involves a mild digression from the main theme of this lecture I feel impelled to say a little more on this subject.

It will, I hope, be conceded that methods adopted for the collection of data of any kind should involve the minimum use of manpower, that the questions asked should be limited to the practical purpose in view, and that they should be so framed as to be both intelligible to the person who has to answer them and capable of being answered with the minimum mental effort and with the minimum number of words.

Unfortunately, however, there are now so many people asking so many questions about so many things that there is not the slightest chance of these

conditions being fulfilled. So much is this the case that in some spheres of control it is almost certain that the economic waste involved in administration exceeds any possible gain that can result.

To make matters worse, there are so many forms to be devised and completed that there are not enough people skilled in the art of their compilation to ensure that the job is done properly, with the result that, both in relation to the number and the nature of questions asked and in relation to the scrutiny of the answers when received, much is left in the hands of the unskilled.

Worse still, a type of person is slowly evolving who spends so much time dealing with forms and who gets so absorbed in the joy of inventing questions that he tends to lose sight of the reason for which questions are being asked—if he ever knew.

Sometimes, it is true, everything starts innocently enough, particularly in the rare case where the person devising the questions has practical knowledge of the field of activity to which the questions relate. In such cases the initial form is often clear, succinctly expressed and easily understood. After that there is a sort of rake's progress. It is first discovered that the form is too rigid to meet the variety of cases which occur in practice, with the consequence that it is modified and revised to meet every foreseeable situation, it being the golden rule of the compiler of forms that flexibility cannot be tolerated and nothing must be left to the discretion of the recipient. The form then becomes so complicated that the average person cannot understand it, and the economic loss in temper and time involved in his efforts to complete it (remember that for non-completion he is generally threatened with dire penalties) begins to grow, and a further economic waste develops in that more and more inexperienced people have to be brought in to scrutinize the answers.

But the worst has yet to come. Faced with the necessity of finding time to do his real job the person answering the questions becomes less regardful of the accuracy of his replies. Moreover, he learns from practical experience that the one crime which he must not commit is to leave a question unanswered, however irrelevant it may be and however difficult, even impossible, it may be for him to answer it correctly. Just as nature abhors a vacuum so does the bureaucrat abhor a blank space on a form. The recipient of the form further discovers from experience, or intuition, that even if his answer is not quite correct it is extremely unlikely that he will be found out and he consequently becomes more and more careless.

In the course of time, therefore, more and more incorrect information is collected about more and more things until the percentage error in the basic data approaches danger point, a point which, in my view, has already been reached. The serious consequences of this should be obvious. Beautiful summaries are made of the data in mechanical fashion by numbers of people with no real statistical training. Volumes of so-called statistics are compiled for the benefit of some central authority, and armed with these the planners get to work, in spite of the fact that the data may be wrong and in many cases already out of date. In the limit the data may find a place in some volume of world statistics in company with equally doubtful data from other countries. Could anything be crazier or more tragic? Lewis Carroll was truly prophetic when, in his account of the trial of the Knave of Hearts in *Alice's Adventures in Wonderland*, he said:

Write that down said the King to the Jury and the Jury eagerly wrote down all three dates on their slates and then added them up and reduced the answer to Pounds, Shillings and Pence.

What is the moral of all this so far as our profession is concerned, and what is its relation to the subject-matter of my lecture? Mainly, it is that concentration on statistics and statistical methods for their own sake, concentration which sometimes verges into morbidity, can lead to the creation of a kind of self-contained statistical world, oblivious to its proper place in the scheme of things and developing a form and magnitude which makes it a destructive instead of a constructive force; and that the actuary, as a result of his training, is better qualified than most experts in the statistical field to foresee this possibility, and to prevent such a cancer developing in any field of activity including that of management. The actuary realizes, or should realize, that statistics and statistical methods, whatever intellectual pleasure they may give to a limited few, have no justification for existence at all unless they contribute directly or indirectly to the smoother, more efficient working of the economic machine, or make some contribution towards raising the standard of life of the community. They are only tools for a job, not the job itself, and they must therefore be not only of the right material but so designed that they efficiently carry out their functions.

As one who is daily faced with the problems of practical administration on a large scale, and is not only in need of such tools but trained in the art of using them, there is one other point that I would like to make in this connexion, namely, that in the industrial sphere speed in the collection of information is more important than meticulous accuracy. If the administrator can have both so much the better, but faced with an ever-changing pattern of things and knowing that rapid decision is vital he would a thousand times rather have information quickly, and himself make allowance for admitted possibilities of error, than have it absolutely correct but too late to be of any use.

This necessity for up-to-date information is naturally most acute in the realm of practical administration, but it is also present, though sometimes in lesser degree, where statistics are required for research work of more profound or of longer term significance.

I know that in this respect I am in large measure preaching to the converted, since the Institute itself has recognized this necessity in its attitude toward the compilation of the main tools of its own trade, namely, mortality tables. It was a significant development when the continuous mortality investigation was inaugurated and machinery developed for circulating results with the minimum loss of time.

Nevertheless, these things need to be said, and if our Institute is to render maximum service (perhaps, even, to continue to exist) the outside world must be made to realize that our very training enables us to anticipate and to help to avoid dangers such as I have somewhat colourfully described, and that amongst our members there is a significant proportion who possess those requisite attributes of personality, courage, imagination and skill which qualify them to be more than mere makers of tools for the job and to be competent to carry out the job itself.

What then can the Institute do to overcome the apathy and misconceptions concerning the profession which are so prevalent in non-actuarial circles, and to secure for those of its members who possess the requisite personal qualities the greater possibilities of achievement which their energy and ability merit?

To answer this question we must first ask ourselves why this apathy and this misconception exist. It is, I think, largely because, belonging as we do to an esoteric profession known to use complicated formulae and unusual symbols, there is a natural tendency for the Institute and its members to be surrounded by

an aura of mystery. There has perhaps been, too, a slight tinge of trade unionism in the Institute's neglect, until recent years, to let the world know what it does.

It is true that through the medium of the Year-Book and in other ways, efforts have been made during the past decade or so to present the profession in a different and more human light, but, either because our propaganda has lacked a cutting edge or because it did not reach a wide enough audience, it has not yet succeeded in dispelling the idea that actuaries are a set of somewhat peculiar people not easily to be assimilated into the ordinary activities of the everyday world.

What then is the remedy? I do not think that the solution lies in giving yet more publicity to the nature of our techniques. In my opinion this will only confirm the prevailing conviction concerning the mysterious character of our science and art. It could, of course, be ultimately remedied by force of example, when many more actuaries than at present have broken down the barriers which prevent our profession from readily entering the commercial and industrial fields, and even then it would not succeed unless all of these actuaries acquitted themselves well. At the very best it would take a long time to solve the problem this way, and it would mean that the early pioneers would have to be selected people and not a random sample of the members of the Institute.

The real remedy, in my view, lies in convincing the outside world, as indeed we must ourselves be convinced, that we *are* competent to extend the range of our activities, and this in its turn demands that we should be able to justify this claim in language which is readily understood. Before, therefore, suggesting how we can most effectively assert ourselves, it is perhaps not inappropriate for me to give my view as to the basis upon which this contention rests.

It rests partly upon the fact that although, with the passing of the years, the Institute has developed more and more into a scientific body, it nevertheless had its origin in the desire of those connected with the management of life assurance institutions to have occasional opportunity of meeting together and consulting on subjects of mutual interest, and the records of the proceedings of the Institute prove that the subordination of the scientific side of the work of the Institute to the practical problems of administration has never disappeared entirely from view. As Mr Starke quite properly pointed out, in his recent paper on the analysis of numerical data, the historical fact is that the actuary's study of life contingencies has never been simply an intellectual exercise, but has been pursued for the specific purpose of providing a systematic basis for the sale of life assurances and annuities.

It rests, too, upon the close relation of our techniques to the art of administration. Apart from the general principles of administration, which for the most part can only be learned by administering, what is the general character of the main problems with which the chief executives in the industrial field have daily to deal? In whatever context it may arise, even in relation to problems as far apart as matters of high policy or the settlement of an unauthorized strike, the most common type of situation in my experience is one where an executive is faced with an array of facts and opinions of varying importance and credibility, and where he has not only to arrange them in such fashion that the main point at issue emerges quickly, but also to present this main point at issue in language which makes it clear to the people with whom he has to deal. In other words, the executive in industry has to have the ability quickly to discern and equally quickly to discard those facts and opinions which are irrelevant to, or insignificant in relation to, the main problem, and to judge the relative weight of those which he admits as relevant and significant. He has also to discern those which by their

nature are likely to remain constant and those which are likely to change with the passing of time. He has, moreover, and perhaps this is equally important, to decide whether all the relevant facts are at his disposal. When all this is done he has to give coherent shape to a mass of untidy and sometimes inconsistent data.

Who better qualified than the actuary to deal with a job such as this? Trained as he is to discover some sort of underlying laws to give coherence and form to what superficially are the blind chances of life such as the probabilities of birth, death, sickness, accident and the like; on the basis of those laws to construct tables of various types to forecast and to assess future events; and so to trust his judgment in these matters that profitable businesses can be built on the basis of it—surely the actuary has just the qualifications necessary for dealing with such a situation as I have outlined.

For fear of being misunderstood let me, however, here interpolate a word of warning. I am not arguing that actuarial training, *per se*, makes a man a good administrator; it clearly does not, but I am arguing that it enables him to acquire the art of administration more quickly and to exercise it more effectively than others. So far as the main principles of administration themselves are concerned, there is no reason why the actuary should not learn them from experience just as readily within the traditional actuarial fields as elsewhere. Indeed, I go further than this and say that only those who have achieved some measure of success in this direction should venture outside.

Our task, therefore, is not to convince the outside world that our special methods and our peculiar techniques are in themselves appropriate for dealing with an industrial situation, but that the quality of mind which enables a man to succeed in the mastery of those methods and techniques, involving, as they do, the art of tempering theory with practical purpose, is very closely allied to the quality of mind which a man must have to be a good administrator.

But it is not only in the exercise of the art of administration itself, but in imparting instruction in it to others that ever-widening opportunities lie.

Those responsible for the leadership of industry, particularly those in charge of the larger and more complex organizations, have become increasingly conscious in recent years that any job which involves authority over others, however low that job may be in the administrative scale, is not one to be lightly given or lightly assumed, and that schemes of training, therefore, must not stop short at training in the actual physical job or in effecting improvements in methods, but must be extended, in selected cases, to cover training in the exercise of responsibility and in the art of supervision, including in this the art of training others.

This modern development is one aspect of the gradual recognition of the fact that administration is an art in itself, the principles of which are universal and need only to be adapted to the circumstances of particular cases.

One positive step in this direction which has taken place both in the U.S.A. and in this country is a practice which is just developing in the large firms called 'Training within Industry for Supervision' or more shortly T.W.I. This training starts right at the bottom and embraces even the humblest employee who is about to be given responsibility over others for the first time.

In essence, T.W.I. is the application of scientific methods to managerial problems, and it takes in its stride the practical fact that the art of administration can only be learned by experience. It does this by discarding the lecture method and adopting group discussion, with practical exercises drawn from the particular business concerned, as the best way of assisting the ordinary man to accept the scientific approach. The training is very elementary in its character, but it is

a great step forward because it teaches men to think logically and to be more objective in their approach than they would be without it. It consists, essentially, in teaching employees in elementary fashion that the problems which will face them when they first assume responsibility are of the same character as, though less in degree than, those which I have already described as facing the chief executive. They are therefore taught not to be too subjective, but to listen to others and to give due weight to credibility; to get all the relevant facts; not to jump to conclusions, but to weigh and decide, to fit the facts together, to consider the bearing of the facts on each other, to consider what possible lines of action there are, to consider their objective and the effect of any action of theirs on individuals or groups of individuals.

In other words, at the bottom of the administrative scale as at the top, trainees are taught that it is imperative to come as quickly as possible to the root of the problem and to decide just what it is they are trying to accomplish.

As this is an administrative course emphasis is naturally laid on the fact that the supervisor, wherever possible, should avoid worrying his superior provided the action falls within his responsibility. Above all T.W.I. is designed to develop skill in the handling of the manifold human problems that arise in day-to-day relationships with others and it is in this field, which in industry might be termed the field of management-and-men relationships, that industry's biggest task at the moment lies. The former structure of industry in which discipline was secured and orders were carried out under threat or fear of dismissal is outmoded. It was a state of affairs which was probably appropriate to a transition period but was too much akin to a master-and-slave condition of society to have hope of permanent survival in an enlightened community.

The chief executive in industry must indeed have qualities akin to those of a good conductor of an orchestra, who appreciates the importance of the human element in his musicians and who knows that the standard of their performance is conditioned, not merely by their skill or the quality of their instruments, but also by their individual moods at the time and the respect and confidence that they have in the conductor. Reciprocally, the conductor, like the administrator, must have a quality of personality or personal magnetism which will enable him to draw out the best from all those that fall under his leadership.

Irrespective, however, of the moral questions involved, the old approach to the human factor in industry is now economically unsound, and the main task which faces the modern administrator is to teach his employees to regard their work not only as a way of earning a living, but as a way of living a life. This means that the modern administrator has, in his own interests, to take into account the personal reactions of all those under his authority to any judgment which he may make, and, long before this, has to recognize, and to make his colleagues recognize, that whereas with the physical machine the exact reaction to a given action can usually be readily worked out in advance this is not so in the case of human beings, particularly in the individual sense. With human beings reactions may be as many as there are people concerned.

In this field, too, I contend that actuaries have some contribution to make. Men and women who have been trained to examine human behaviour and to assess its consequences, and indeed have reduced it in certain cases to scientific terms—such as 'selection' in the case of life assurance—men and women who take it for granted that within certain limits large numbers of women will understate their ages on a census form—who better than these are qualified to take a hand in the management-and-men relationship problem.

I hope I have now said enough to convince you that if the Institute as a body, and its members individually, have an appropriate conceit of themselves and are prepared to act accordingly, the possibilities of extending the usefulness of the profession are practically limitless. I can assure you that not only are the opportunities in industry there but the prizes are attractive.

The Council, by its decisions in respect of future methods of recruitment, training and examination, has already done much to clear the road that I have endeavoured to signpost, but much still remains to be done before others already at the destination have even noticed that we are on our way; the remedy for that I suggest lies in the hands of the members of the Institute themselves.

We must obviously consider seriously the extent to which actuaries should be encouraged to go outside those traditional fields in which their special techniques can be directly applied. Indeed, it might be argued that as there is no unemployment in the profession all that I am saying is of little consequence, and that the cobbler would do far better to stick to his last. Personally, I disagree with this argument if it has a restrictive implication. I look forward to the day when, as a result of the revision of the syllabus and of improved methods of recruitment, training and examination, the number of qualified actuaries will be greatly increased, and that, of the new recruits, an adequate proportion will have the necessary personal qualities and the appropriate urge to extend the range of their activities and responsibilities. I contend that even if the cobbler sticks to his last he should not restrict his art to a particular type of footwear. He should realize that, both in number and in style, usages and fashions can change in marked degree, and he should be quick to take advantage of modern trends.

Even so, I admit that when seeking recruits to our profession we must face the fact that, in view of the growing development of well thought-out education and training schemes in large industrial and commercial organizations, with regular tests of efficiency, personality and special flair, a young man may doubt whether it is wise to go through the hard grind of actuarial examinations with their possible cramping effect on his general outlook, when he could probably succeed just as well and in the same fields if he went direct into industry or commerce. In other words, if his ambition lies in the direction of industrial administration why not take the direct road? The answer is that by becoming an actuary he secures at least one string to his bow, in that, provided that he possesses the requisite ability to pass the examinations in a reasonable period of time, he assures himself of a professional qualification which secures his position in the life assurance and allied spheres, so that if, additionally, he possesses the requisite personal qualities the whole world is open to him.

Clearly, a large percentage of actuaries, whatever our numbers, will continue, indeed must continue, to be engaged in those special categories of activity which gave rise to our profession, but, remembering that there have been no fundamental contributions to actuarial science for many years now, I have a feeling that if the Institute is to continue to exist as a vital living force it must look to an extension of the use of its techniques rather than to any improvement in the techniques themselves.

I make no claim to having established in any *a priori* mathematical sense my contention that actuaries are well qualified to take their place in industrial management; I am, indeed, very conscious that there is a large measure of empiricism in my arguments in support of this thesis and that I have, perhaps, been too much influenced by my own experiences in relatively unexplored territory. I make, however, no apology for this, since it is probably true to say that through-

out the ages human advancement has owed more to the empirical approach than to the rational, and if I have done no more than furnish evidence that in the realm of industrial management there lies the possibility of wider outlets for your skill I shall at least have achieved something.

New problems are daily arising in the industrial and commercial worlds as the result of the growth in size and the change in structure of the undertakings engaged in them; problems which are both a danger and an opportunity; problems which demand for their solution a departure from traditional habits of thought, a positive attitude of mind and the qualities of leadership, and it is because I believe that within our ranks there are many who are competent to solve these problems, but who have not yet been brought into contact with them, that I have ventured to deliver this somewhat provocative lecture tonight.