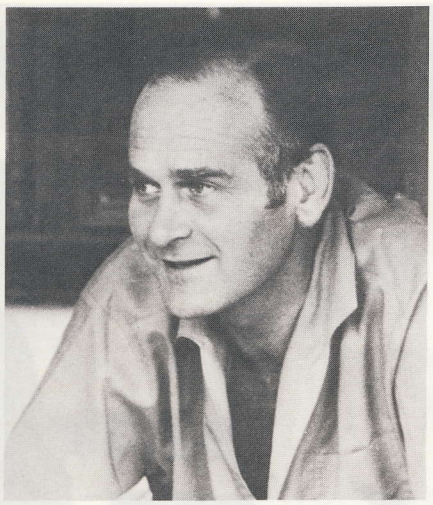
Country Cousins — Dr Ronald Ingle



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Curriculum vitae

Ronald Ingle was born in China, the son of a Baptist missionary who was Professor of Surgery at Cheeloo University (the first to translate Gray's Anatomy into Chinese). He graduated in Britain. In 1958, after 5 years in the Royal Air Force, firstly as a Station MO in Malaya, then in surgery in the UK, he joined the USPG Anglican missionary society and was sent to All Saints' Hospital in Transkei to join Dr Pauline Marshall. They married in 1960 and remained at All Saints' until 1976. He went to the new Transkei's Department of Health to be the first Chief MO for Primary Care and subsequently Deputy Secretary for Health. In 1985, after 3 years as a Tuberculosis Officer in the Eastern Cape, he joined the Department of Family Medicine at Medunsa. He has held offices in the Transkei and Ciskei Association of Mission Hospitals, the Consultative Committee for South African Medical Missions, the Transkei and Ciskei Research Society and the South African National Council for Health Education.

Summary

The difficulties in communication that arise in continuing medical education are often related to the two worlds of the medical school and the rural practitioner. Working in rural areas helps doctors work out medical priorities which others never really seem to consider. It is as if you belong to a different medical culture, and you realize what medicine is all about - not the luxury of just knowng more and more, but to reach out and serve.

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The experience of going to a Workshop on Medicine among Black People in South Africa has made me realise that many of the things that I have come to believe in, regarding the future of medicine, really need to be expressed pretty forcibly.

I know that I went - I admit that I went - expecting to learn about the topics that were to be presented. I went accepting that. But as I sat there and experienced what was really going on I felt certain themes regarding medicine as a whole emerging so clearly that they dominated my experience more than the learning. So I made my notes, and I listened to the scientific aspects of what was being said; and that was OK. But for me that was only part of it.

It was called a "Workshop on Medicine for Black People in South Africa" but in fact it was very much a teaching programme based on the medical work with black people in that university hospital. They had said that there would be ample time for discussion but in fact, as in so many of these programmes, people over-ran their time and there were only five or so minutes left at the end for questions and that isn't actually a workshop. I don't think they should borrow the term just because it's currently popular and sounds, perhaps, attractive to people.

Let us briefly look at the meanings of those words, workshop and seminar. I don't think workshop has yet got an acceptable definition. It hasn't got to the point of needing to have one. It soon will.

Seminar: "In German universities (hence in certain British and American universities) a select group of advanced students associated for advanced studies and original research under a Professor's guidance. Also a class that meets for systematic study under the direction of a teacher"

Symposium: "A drinking party, the convivial meeting for drinking, conversation and intellectual entertainment". (That's a good start!) "An account of such a meeting or the conversation at it. A meeting or conference for the discussion of some subject, hence a collection of opinion delivered or a series of articles contributed by a number of persons on a special topic".

That's how I understand a symposium to be - a predetermined presentation. In a seminar there is, I think, the idea of off-the-cuff contributions but still the selected subjects. But I don't think workshop

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has yet got to the point of an acceptable definition. It'll soon have to!

Anyhow a workshop, as I see it, allows full participation by everybody, not only the specialists, working out of what the agenda ought to be. You can start by choosing a theme or field or problem. The time-table should provide for discovering unexpected aspects of problems which might be more pressing for discussion, allow for people to express directions that they think should be taken. The leadership should identify these, and the structure should allow for the coming to conclusions about them before it's over.

At first, on the first day of the thing, some of us tried to ask some of the questions that concerned us in the particular fields. But we found that our questions weren't readily understood, whereas the academics asked questions that were understood and taken up.

Our questions were not understood because they were not expressing the kinds of thing they were used to hearing as questions and were used to answering. Now it may be that our questions are new kinds of questions, and we are not very good at formulating them, and therefore they need to be *listened* to. And this is one of the things in a workshop, and amongst teachers - that they must be prepared to *listen* to the questions that the students ask - that the learners try to ask - and try to identify what they are actually getting at. A bad question shouldn't necessarily be dismissed. So you get left with the feeling that your questions are freak questions.

> Working in a rural practice, we are from a different medical culture

And so we went into the second day, some of us wondering what would happen to our reactions to some of these things. But this is where the group psychology of the whole thing works. We are in a minority and so it's hard work to put forward a point of view that's not readily understood. What's more, we might embarass the people who are the hosts.

By the third day we really succumbed - were anaesthetised - by this practised exhibition of the way they were used to talking, and discussing, and counter-arguing; and our voices became quiet. But in the end we felt left out. We were left feeling this is not really talking about medicine in South Africa because we see a different context altogether from them. And so the very term "medicine among black people in South Africa" means different things to us. This we weren't able to discuss. If you talk about working without a laboratory for example, they will think "well, that is a terrible handicap which presumably you will overcome, but meanwhile, without one, you can't really practise the kind of medicine which we are talking about, so if you'll forgive us, don't ask questions against that kind of background . . .". These are the questions they will tend

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to regard as unanswerable, questions that shouldn't really have been asked. If you point out that this is not possible, and that is not possible, they will see it as invalidating the question. So I crystallised this in the expression "country cousins". People are very kind to their country cousins – a term I am using to describe what people think of as "mission hospital doctors". They are very kind to you, they welcome you, they think of you as people who are working very hard, yes, and making extraordinary efforts under very difficult circumstances, yes. But the fact is they think of you as people who are trying to do what they do, trying to create hospitals in way-out places where, by hook or by crook, you will try to imitate, try to develop, little models of what they have.

And if the buildings can't be up to standard, at least you will try to do the same things in them? No, not the same. I believe that if you provide an *acceptable* regime of treatment to *all* the patients with a certain condition you know that a pretty high proportion will do fairly well. Now in the circumstances in which we are working that is an acceptable standard. You can't afford the time to try to raise that result up to a hundred per cent. If you try you are likely to precipitate a breakdown in the situation. You will find, where we work, where doctors come trained in first-world medicine, we spend an awful lot of time discussing variations in regimes, choices of drugs, dosage problems, and so on. It's effect is to improve the quality of care of only a small proportion of patients. And a result of variations in regimes is uncertainty for the nurses, extra effort in stock control and ordering, and even disuse and waste of drugs. And yet the profession regards this as the glory of free and independant medical practice! Whereas in the context I am talking about it can't be afforded. It's a sort of licence, not freedom.

New kinds of questions which the medical profession is not used to answering

This calls for change in us. I believe that the elements of sound medical care must be distilled down to basics which can be applied to caring for people in hospitals with, not a minimum, but a reduced amount of one-to-one supervision. Basic treatments have to be consolidated so that they can be used in less skilled hands and even delegated, for there are these two levels: the rural hospital and the clinic.

Another point I want to make is – provided of course it's agreed we *are* working together in one total field of health care – that it's their obligation, those people who have the depth of clinical experience and knowledge, supported by their research work, to provide us with a distillation of sound and acceptable regimes, instead of trying to produce these

We learnt something about working with priorities

simplifications as we have to at the moment. Then their insitutions can go ahead with the experimental approach.

Research, with the aid these days of computers and statistics, is being used to solve organisational problems, and it seems to me such resources could be used to resolve such therapeutic issues. In fact it's called "decision analysis". But these are new kinds of questions and the medical profession is not used to answering them. They are not regarded as necessary. But we believe they are. We want the skill and know-how and resources of medical science to master these new kinds of questions. We believe it is an obligation for all these scientific assets to be directed, not towards the finer and finer vertical solutions of restricted problems, but to working laterally to solve the questions and situations that those of us in the areas of greater need are faced with. But if you plead for the redirection of research towards answering the kind of questions we ask, people will say:

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Oh my God, this is what happens in communist regimes, this is state control. That's the reaction of our free-enterprise school!

As a result of our experience as country cousins of limited resources we have learnt something about working with priorities. We are really *ahead* in our experience of priorities compared with the profession in developed countries who haven't had to ask these questions because their cost-ceilings have been much higher. But in many of those countries, now, they have been hitting those ceilings. It's most interesting to see how they are beginning to battle with the priority question. Whereas we were considering who could get Ampicillin, they are discussing who is entitled to renal dialysis - the same kind of question really. We have actually had *more* experience of thinking and working like that! To us it's a real, live, honest problem. To many of them it has been a kind of infliction of the bureaucracy. The average doctor does indeed see limitation of choice, say of antibiotics, as some kind of dirty trick played on him by an administrator, whereas many of us see it as an honest use of a country's resources. We have met people who think this way and we have read the literature in which such thought is vividly and forcefully presented. Then we *know* we are on the right track.

To us it's a real, live, honest problem

It is only when you get into that other situation that you get an inferiority complex! For if you talk like this in an academic situation people will regard you as being a second-rate doctor with lowered standards -lowered ideals - who is betraying his professional values; and they don't want to listen to you seriously. They are surprised that you are willing to talk like that, whereas if you talk like that in the company of men who work in these situations, who are thinking in terms of the vast need, the way you are talking is understood.

It's a pity, with the growing awareness of the problems of rural practice in this country, that there is such a divergence of attitude. It's clear to me that this is because we are from different medical cultures. We know how difficult it may be to talk to people from another culture. It's not easy to converse because you don't have a common language; or, if you do, you use it differently. We realise that the society - the culture, that is - into which you were born and lived and the experiences you have had make you see things differently. I'm convinced that no matter how fervently you try to express yourself, it's extremely difficult to be understood when a gulf of experience separates you. I don't mean experience in the sense of making you better at it. I mean experience in the sense of what happens to you. No matter how clearly you express it you know that these guys, because of the background they come from, won't hear you.

Status - who you are - makes it worse. You know how important his degree is to the newly-qualified! In retrospect we can smile about it, at the way it doesn't really qualify you for very much, but to the graduate it means a very great deal. It's rather like that with these chaps. This is what they have learned and the way they have learned it; it's what has got them to where they are, and it's integrated with their assurance and their commanding outlook. They need to live by what they are used to. Otherwise they don't know where they are. So this isn't just a question of an intellectual game; it's not just a case of questions and answers; it's a question of different medical cultures. No wonder they don't understand us! And that is the kind of image they have of their country cousins, the mission hospital doctors. And some years ago this is actually how we looked at ourselves also - I know it!

They need to live by what they are used to

But in fact, now, we have changed and we have confidence that in our change of view and in our change of thinking we have support, because we happen to move in a different circle, a different medical sub-culture. Many of us are reading international literature which links us with prominent people with experience of what is called third-world medicine. We are encouraged by this to re-identify ourselves as people who perceive that this situation, which they regard as an unfortunate temporary situation which progress and facilities will eliminate, we regard as being by no means temporary but a fairly world-wide fact which calls us to reassess what medicine is all about and how it should serve the majority of people.

They are not in touch with this opinion which is why, when we speak

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in their milieu, in their environment, their culture, it's not acceptable. I think the difference is that the people in these institutions still think, as we used to, in terms of the people who are fortunate enough to come under their care and be given proper medical care on their terms.

Sure, they've got difficulties of overcrowding, and shortage of staff, and accommodation, and so on; they battle with that. But their sights are still set on the same kind of medicine that we were trained in. That was our view-point too. As I've already said we also tried to improve our model under these circumstances, and tried to apply those criteria of proper medical care to the people who were fortunate enough to get to us. But it was the wrong model! We have this awareness that we have got to devote some kind of care to far more people, whereas we don't think they really think like that. And this is why we re-examine our assets, in terms of medically-trained assistance, paramedical assistance and so on.

If they were trying to help us – and that was the object of the course – they should have devoted some of the

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time at the beginning to getting themselves orientated to us. They *thought* they were trying to help us by talking about medical subjects. It's not medicine's purpose to know more and more. It's a luxury to know more and more about, say a *myopathy*. Medicine's purpose is to reach out and do something about all those *people* who have myopathy. "But it's only by exploring the details of this myopathy that we can come up with the answers". My answer to that is : OK, but I also feel that we have accumulated a vast amount of knowledge about a lot of things and we may have to be content with what is serviceable for the time being, and at least apply it. Because we are on a sinking ship, and this needs to be acknowledged.

We feel we are pioneering a necessary revolution in medicine and we've got to make it respectable. I am saying that this plea depends on the essential nature of what we call medical standards. I'm pleading that we've got new kinds of medical standards, which are not necessarily a disgrace. And when our voices are raised in these terms in academic circles, instead of being regarded as second-

To re-assess what medicine is all about, and how it should serve the majority of people

rate questions, they must be heard as being real questions. We feel it's time to say it's not what the *medical profession* want it to be, wanting to preserve how it *has* been, mainly for the sake of their idea of what medical standards are about. We say medicine is a *serving* profession, and we have to be prepared to change, and respond in the ways that circumstances demand. If the medical profession found itself pitch-forked into a full-scale war, then they know jolly well that they've got to make do. In World War II when they worked in the Desert they worked as circumstances allowed them to work (and out of that they discovered lots of things). But they didn't question the circumstances. A doctor who worked in a prisoner-of-war camp couldn't question the circumstances but used his knowledge as best he could.

The purpose is to reach out and do something

Conferences have been known to be taken over from the floor. You've heard of students taking over a conference and throwing the panel off the platform! And how people more or less tell others : Look, you're talking rubbish! But you say : You can't take over somebody's thing.

And yet, if there is an urgency about it, you may feel it's part of your prophetic function to tell people that they need their eyes opened.

That was our dilemma. But in the end we accepted it on their terms. We didn't collectively form a strong enough voice. Not even at the end to say: Look, we haven't said anything up to now; we've taken it as you've given it to us. But now we would like to say a few things. We thank you for having us and for all we've heard. But we would like you to listen to what it has made us want to say, because we don't often get a chance to say these things -we country cousins.

But it's difficult to put across these views even so without sounding fanatical, churlish and lacking in both taste and manners. I couldn't say it at the close of the "workshop", when they asked people to comment. This was the moment for which I'd thought up a speech in my mind which went: Look, I am going to say what I know it is hard for you to accept. But I think it is so important that I am going to try and say it...

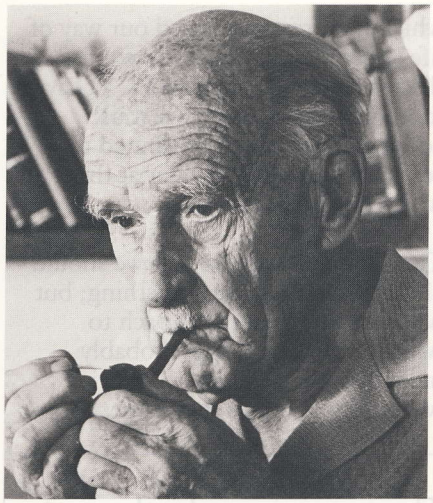
Had I enjoyed it? Yes, a trip back to the old medical school days, listening to people speaking with such precision, and clarity, and inventiveness. Yes, it was a pleasure of its kind, like going to play squash after a long lay off, revelling in the exercise and flexing of unused muscles. *But it's not the game we are actually playing!*

A workshop? Let me look this up in a dictionary after all. *Workshop:* "A room, apartment or building, in which manual or industrial work is carried on"! Look at this: Workhouse (that's what my mother used to call our hospital!).

Workhouse: "A house, shop or room in which work is regularly performed. A house established for the provision of work, for the employed poor of the parish. Later, an institution administered by the Guardians of the poor in which Paupers are lodged, and the able-bodied set to work."

That's us.

The spirit of research — Dr F W Fox



Dr F W Fox DSc

Curriculum vitae

Dr Fox was born in England and obtained a MSc from London University. He then joined the South African Institute for Medical Research (SAIMR) and soon afterwards was awarded the DSc degree from London. He died on 7th November 1982 at the age of 88, still working at the SAIMR as Research Officer Emeritus. He was a humble and compassionate man who saw no division between the sacred and the secular: the secular had a sacred overlay and the sacred influenced his research life. He was committed to research for the benefit of people, especially the impoverished. He did not seek fame, but his work was recognised world wide. He was the first in South Africa to carry out extensive food surveys and to delineate numerous biochemical and metabolical aspects of diseases of under-nutrition and over-nutrition, making major contributions on scurvy and obesity. Throughout his career he published a great deal. After 50 years of intermittent work, he published a very well received book, 'Food from the Veld', which describes hundreds of edible plants in Southern Africa. He *lived* until he died. He lives on in faith and in our memories.

Based on a talk given to TACRESOC - Transkei and Ciskei Research Society.
19th April, 1982

Summary

The enthusiastic, questioning, researching mind of a small child can easily be subdued by the wrong environment. A true scientist should nurture his deep-seated curiosity and hunger for knowledge, develop a disciplined mind which stays alert and open to the wonders of new discoveries. The author refers to his own experiences, hoping to help younger people avoid some mistakes.

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To be invited to give the first Noristan Address to the society was an unexpected honour which I appreciate and for which I want to thank you. It is also a real pleasure to which I have looked forward, for it enables me to join in the tribute you have paid to the late Hans Snyckers and the Noristan Organisation which has made the existence of the society possible. Ever since its inception I have watched its progress knowing it was fulfilling a valuable and to some extent unique function: it was good to hear that you are taking the bold step of standing on your own feet and I wish you well in the future. Lastly, you have given me this chance to visit the Transkei and Umtata, for it was here, many years ago, that I became converted from the conventional to a wider vision of what the study of nutrition is about.

Since this is a research society it seemed appropriate that in this first Noristan address we should think about the research concept itself, its origin and application to this area which is so rich in opportunities.

I can only draw on my own experience hoping to help you avoid some of the mistakes I have made. Let us start at the beginning.

Once we were all tiny babies. Our wants were few but clamant, so we lost no time in investigating our environment which rapidly started to expand. The tools available were a complex mixture of curiosity, observation, intuition, reflection, reason and imagination, but at first they were chiefly curiosity and observation. Both of these are highly developed in other animals. Take the ant for example: you find him in the most unlikely places and should you ask him what he is doing he says 'Oh, I'm just looking around.'

We certainly got off to a good start for it wasn't long before we deserved a degree in psychology for the way we twisted mother round our fingers; after taking the advanced course we learnt how to 'rule the roost' or pit parent against parent if this helped in getting our own way. Not so very much later we were exhausting both parents and friends by our inexhaustible energy as well as by the interminable questions we asked. Those 'six honest serving men' in the verses of Kipling: why?, when?, who?, what? and how? How we pounced if the story teller wasn't word-perfect; how we picked up long words and used them appropriately at the first attempt; with what ease did we learn the languages of the children we played with as well as the expressions our parents hoped we hadn't heard! Do you remember instructing your friends as to the make of an

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approaching motor car; how accurately we imitated all manner of sounds that we heard; or how hard we would slave to accomplish some ambitious task we imposed on ourselves. Yes, in those days we were capable, hard working, highly observant investigators who had caught *the true spirit of research.*

And then came school days. Fortunate was the child whose school encouraged, maintained or enlarged his enthusiasms; where he discovered the warmth of doing his best for his team, and the value of being sometimes allowed to daydream. How sad it is that for many children this formative time is one to be endured and got through as quickly as possible; when an avalanche of facts and the opinions of others must be absorbed; when the wonders of literature, art and science are just 'subjects' that must be 'passed' rather than enjoyed. Of course this is both an exaggeration and an oversimplification, for usually there are some teachers who fire the imagination of their pupils; nor is it a

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Look with wonder at that which lies before you

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reflection on the teaching profession who often have to contend with great difficulties. But, whatever the reasons, it is a fact that many adults adopt a passive attitude to life having lost the thirst for knowledge, that eager desire to explore their environment which is so characteristic of childhood. They are more or less prepared to accept things as they are, to adopt the opinions of others, watch others engage in sport and to seek to be entertained rather than experience the joy of creative activity. The spirit of research can but languish in such an atmosphere.

But there is always a minority who are different; emerging unscathed with their quota of curiosity and their urge to observe and explore unimpaired, otherwise there would be no members of this society nor of other disciplines. Deep-seated curiosity and the ability to be acutely observant are clearly noticeable in our naturalists. This can be observed in such radio programmes as 'Talking of Nature'. I am often amazed, not only at the complexities of nature which they describe, but by the extent to which they are endowed with these abilities and the enthusiasm with which they use them.

Most of us would admit, I expect, that any ability we possess in these directions must be cherished, for we all tend to take things for granted, imagine we 'know' when in fact we are but scratching the surface.

I well remember the occasion when this tendency was abruptly brought home to me while at college. At our first botany practical we were issued with a cabbage leaf. Although no botanist I did think I knew a cabbage leaf when I saw one. Having evidently noticed my look of disdain the Professor came to me and said 'Mr Fox, if you studied a cabbage leaf for the rest of your life you would never know all about it.'

My smugness was of the same type as that of the man in the USA Patent Office, about 1880, who recommended that it be closed down since there was nothing left to discover! How astounded he would be at the subsequent discoveries which have revolutionised our way of life and will continue to do so, for discoveries beget discoveries. Today, more than ever before, we must adopt the injunction attributed to Jesus 'to look with wonder at that which lies before you'.

This is not to suggest that we should all start investigating something; but what matters is our approach to whatever we are doing. Probably most members will say that their work fully occupies their time.

The more we ponder the meaning of what we are seeing, the more likely will be the occasional insight

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However, history teaches that this close contact with life has been responsible for some impressive advances, far less likely to have been made by those who live in ivory towers. Sometimes the hobbies of very busy men, for instance, natural history or astronomy have been most fruitful. I am thinking particularly of those who feel imprisoned in a dull life of routine, because day after day they do the same work over and over again. Of course there are those who prefer a routine job as we found out in our laboratory when one of our staff flatly refused our offer of a far more interesting job.

A more alert mind may be able to turn the situation to good account. Here is an opposite example that occurred in our laboratory. One of our daily chores was to carry out a number of simple tests on a seemingly unending succession of urine samples sent in by the Miners' Phthisis Bureau, the General

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Hospital or by General Practitioners; most samples were usually normal but it was a slow tedious job, for the centrifugalised deposit, if any, had also to be examined microscopically. Possibly out of sheer boredom my colleague, HD Barnes, began to study the colours of the urines with the aid of a small hand spectroscope. Incidentally, this enabled him to reassure mothers whose children were eating gaudily coloured sweets. In this way he began to discover occasional unexpected cases of porphyrinuria. After much further work in which he isolated, purified and studied the pigments, as well as patiently tracing relatives of the original patients and sometimes their ancestors, his enterprise gained him a doctorate.

Again how many bacteriologists must have been familiar with the set-up that led to the discovery of penicillin. Its very familiarity dulled their eyes and their minds to what was taking place. The constant repetition of the same procedure becomes a habit requiring no thought. But the more curious we are, the more acute are our observations; the more we

Discoveries are made by the prepared mind

ponder the meaning of what we are seeing, the more likely will be the occasional insight. The attitude we strive to adopt is what matters. How right Pasteur was when he said that 'discoveries are made by the prepared mind'.

But what about equipment? I think it is a misconception to believe that today an investigator must necessarily be armed with elaborate and expensive equipment. Of course this is true for some kinds of study although usually less so in the biological field. Moreover, if it is a question of undertaking a worthwhile well-motivated project there are agencies which will make the necessary equipment available, as well as offer advice as to how best it should be conducted. These agencies may also be willing to carry out analyses or other tests on samples collected in the field. When compared with the facilities available even a relatively short while ago, those commonly in use today are immeasurably more helpful, increasing both the range and the quality of what can be done. But the opportunities open to the individual investigator, using the very minimum

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of equipment, as well as the value of the contributions he can make must never be minimised. Perhaps we should remind ourselves that the equipment used by Archimedes, Newton and Fleming was a bath, an apple and a few petri dishes respectively.

Ideas are precious and should be treated accordingly. They may arise from your work, something you read, or a friend's remark or 'out of the blue'. But when they knock at the door of your mind receive them hospitably, particularly if they sound absurd, impossible or unorthodox. Since they can vanish as unexpectedly as they came it may sometimes be well to note them down. Should they recur again and again your subconscious mind has become interested and you will get no rest until you have explored them, pull them this way and that, like a terrier with a rag. Should a new idea stand up to your criticism and seem to have merit, explore it on paper as fully as possible, but don't dull its freshness by reading about similar or relevant ideas. Perhaps that is what Bacon meant when he said 'reading rots the mind'. Your premises may be different, giving you a deeper insight to those who have turned it down.

Ideas are precious and should be treated accordingly — receive them hospitably and note them down

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New concepts rarely come fully fledged. More often they develop from small beginnings. Your idea - your hypothesis - may require to be tested by means of lengthy experimentation and consideration of the relevant 'literature'. Don't be discouraged if what seemed to be a promising idea must be abandoned. It may be a 'hunch' that will take its time to develop.

Members living in African communities have opportunities denied to most of us. Not only can they fill out or add to the accounts given to us by anthropologists and others, but they can gain the confidence of older inhabitants and listen to the wisdom that no longer interests the present generation. Are we not forgetting that the peoples of the world managed surprisingly well to get on before the development of science and the use of the scientific method. Indeed, their outstanding achievements defy our attempts to imitate, far less to surpass them. But of greater importance were the skills they acquired to face the problems of day to day living. In southern Africa, because they are more obvious, we are impressed with the skill shown by Blacks in tracking wild animals; in their profound knowledge of plants useful for food or for medicine; in their handicrafts and their ability to deal with psychological disturbances and other problems. But they learnt much else about the more intangible issues of life which were often embodied in stories, sayings, remedies and the like. When we remember that everything had to be transmitted to the next generation by word of mouth, it is understandable that such information might be distorted in the process. Rather than dismiss them as nonsense or 'old wives tales', ought we not to study some of the more significant ones, trying to discover their underlying truth? Some examples taken at random: over 2 000 years ago there were Italian peasants who suspected that malaria and mosquitoes were in some way associated; later there were people who believed that jam moulds if applied to wounds hastened the healing process; and English dairymaids who believed that if they contracted cowpox they would not catch smallpox.

If you decide to publish an account of your research, remember its reception will be unpredictable.

The joy of research must be found in the doing, since every other harvest is uncertain

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Owing to the volume of articles appearing in the scientific journals it may be overlooked even by those most interested in your field; or it may lead to stimulating correspondence with new friends. The same unpredictability may attend the publication of outstanding discoveries. Here are two extreme examples: Jenner's discovery that something taken from a sick animal would protect a child from smallpox must have seemed a strange - indeed a repugnant - concept; yet it was acclaimed at once and adopted both in Britain and in other countries. However, a simple sensible way of preventing the dreaded puerperal fever, discovered by Semmelweis, met with bitter and violent opposition which eventually drove him into an asylum for lunatics; however, he never lost faith that the truth would ultimately prevail. More recently we have the bitter cynical remark attributed to Max Planck that 'scientists never change their minds but eventually they die'.

Remember also that there is one reward which will never fail those

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motivated by the true spirit of research, namely the satisfaction and pleasure that comes when one has done one's best. 'The joy of research must be found in the doing, since every other harvest is uncertain.' How well Kipling understood this when he imagined the future life of a painter worker with 'brushes of comet's hair'.

'And only the Master shall praise us, and only the Master shall blame;
And no one shall work for money, and no one shall work for fame,
But each for the joy of the working,
and each in his separate star;
Shall draw the Thing as he sees it for the God of Things as they are!"

Relevant Reading

Paul Kenn. Problems and facilities of field studies in Africa with special reference to cancer surveys. *S Afr Med J* 1970: 1143-1146.

Beveridge, WIB. The Art of Scientific Investigation. London, Heinemann. 1979.