

II

ON STUDYING THE COMMONEST DISEASES

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The title of this symposium is "Ways and Means in General Practitioner Research". Peculiar difficulties face the general practitioner attempting to undertake research. Some are due to his mode of life—working long hours, crowded, interrupted, uncertain; leisure uncertain too, and burdened with domestic duties, civic responsibilities, hospital committees, family obligations, the necessity to take exercise and the claims of friendship. Over everything like a cloud of smog lies the deadening effect of chronic fatigue and the nagging anxiety of chronic responsibility. Other difficulties are imposed by the nature of the daily work which is also the raw material of any research he may decide to undertake. Apart from therapeutic trials, he has nowadays little opportunity for experiment, so that his research will probably be observational and he has no control over the flow of his material. The chosen malady will disappear mysteriously from his patients for months or years, only to reappear in quantity when the poor fellow is worked off his feet with an epidemic of influenza, down with the disease himself, or away on vacation.

To the general practitioner research-worker, therefore, Ways and Means are important. "Ways" I will take to be devices used by the doctor to anticipate and by-pass his peculiar difficulties, whilst taking full advantage of his unique situation. "Means" I will take to be aids not normally found in the impedimenta of general practice: computing-machines, extra secretarial or other ancillary help, financial grants, specialist advice and collaboration.

The Ways and Means will vary with the type of problem, the rarity of the chosen condition, and according as the general practitioner works alone or in concert. Dr. Tuckman has described research in collaboration with others and I understand that Prof. Platt will be considering chiefly clinical research. My principles will therefore apply largely to epidemiological research by the solo worker. Usually one must content oneself with mastering the Ways for many years. The Means that are imperative will gradually become clear. Ill-chosen Means can prove at best wasteful, at worst an incubus. For example, additional personnel can be of paramount value in an investigation, but these extra people need to be fed with relevant work, and the busy general practitioner may find the provision and supervision of their work insuperably difficult. Benevolent bodies granting money may call for reports on the use of it. Writing reports, writing anything in general practice, is no light matter. Let us not,

therefore, call for outside help until we are so much masters of our problems, and of the methods that are needed for their solution, that we can see our way ahead fairly clearly.

The General-Practitioner Research Worker

Research is often a highly individual affair and general practitioners, thank God, tend to be individualists, so that one must feel very shy of pontificating on the subject of general practitioner research. Nevertheless certain experiences convince me that there are some things about it that ought to be said, and some others that may be worth saying.

First then as to the man himself. A belief is current that the general practitioner will be a better general practitioner if he has some medical specialty—e.g., and interest in eyes, ear nose and throat, cardiology or research. I do not share this belief. General practice is itself the most demanding of medical specialties, as all of you know. The mental agility required for the best conduct of an average 'surgery-hour' is of a very high order indeed. The man who has a deep interest in general practice itself is likely to be the best family doctor. Nevertheless every man needs a hobby, and I think a hobby makes for a better general practitioner. The hobby may be music, drawing, the growing of roses—or research. General practitioners, on the whole, make very good things of their hobbies: Muir with his study of "Body and Brain in Fish"; Oliver Gray extending his father's beautiful technique for demonstrating the inner ear and the labyrinth, and tracing it back to its early beginnings in the animal kingdom; Day of Dorchester, the world's authority on one family of dipterous flies. You can all doubtless cap these examples with half-a-dozen others.

I suggest to you that research in general practice falls into the category of hobbies, and is certainly no better than they and, indeed, may rather be deleterious in its effect upon the daily work which is our *raison d'être*. In the first place if his patients suspect him of it—and patients are suspicious animals—they are likely to resent it. They claim quite reasonably that he should be their doctor, not they his guinea pigs. Wisdom therefore suggests that he should keep silent about his interests. Secondly he must move with exceptional delicacy amongst his colleagues, who may understandably suppose that his passion for research will have a quite opposite effect on *their* patients. His ethics must always be above reproach and be known to be so. Thirdly, the man for whom research is a hobby is a man liable to be captured by ideas. The divine afflatus blows upon him and he is possessed. He rises and lies down with his idea. It follows him wherever he may be—at his food, at social gatherings, at his devotions. He is silent with his friends and his family unless he is boring them with the latest burgeoning of the spirit. He will take

the temperature and the pulse of his patient and look at the tongue, and suddenly realise that he has no memory of what he has done. He is more like a poet than a doctor.

But if he has truly been afflicted with this terrible hobby, we cannot cure him and must see how he can best be helped. As with any other hobby, advice may be valuable, but the best place to learn is on the job. He has an urge to unveil the mysteries of the goddess Dyshygeia. Bursting with enthusiasm he will see his medical environment bristling with problems. Each consulting hour, every third visit will provide him with one or more stimulating and provoking questions. The first mistake, as Dr. Tuckman has already pointed out, is often to take on too much—far, far too much. If we tackle one small problem well, if we add one tiny fraction to the sum of knowledge, we shall find we have turned the key and unlocked the door to room after fascinating room of treasure. If we attempt too much, we risk banging uselessly on the door, ignoring the little keyhole, until we retire defeated with sore hand and frustrated hearts.

Ways

Way No. 1 is therefore to *limit our objectives*. No absolute advice can be given on how this should be done, but perhaps Way No. 2 is helpful here: *Seize on the obvious features*. The salient facts of disease are often ill-understood. Their very eminence seems often to cause them to be overlooked by a sort of scientist's perversity. Let me give an illustration. For years, for millennia, we have known that cases of certain diseases follow one another at a more or less constant interval. The interval seems so obvious and natural that it has been taken for granted without much thought to its significance. But it was thinking about this interval—first in connection with Infectious Hepatitis and later in connection with measles, chickenpox and mumps—that provided my little golden key that opened the door into the treasure-house. Some people are born with a ready aptitude for recognising the significance of related phenomena. To most of us, alas, original thought is travail and the result requires a long period of gestation. So it was with me. I had to live with my problem for many months before the penny suddenly dropped and the simple answer stood forth in its beauty—and obviousness. That is another story for which there is not time this morning, but it brings me to my Ways Nos. 3 and 4.

Way No. 3. To do research in general practice we must be *prepared to spend a very long time* (often apparently unrewarding) *on each small problem*. I am glad that Dr. Tuckman has emphasized this. The faith that sustains us through these seemingly sterile hours, weeks, months, years, is similar to Claude Bernard's assertion—"There is

no such thing as an unsuccessful experiment". For the observational worker this needs to be re-written, "Every natural occurrence has significance".

Way No. 4. *Nature is bending over backwards trying to tell us about herself*, and only our blindness prevents us drawing the obvious deductions. The salient facts of illness probably carry the salient meanings for us. Wilfrid Trotter was wont to observe that he was astounded not at the discoveries of mankind, but at the stupidity that could so persistently overlook the correct inferences from the oft repeated facts.

Way No. 5 is to *extract the relevant facts* from our mass of raw material—the facts, the full facts, and nothing but the facts. Get them out so so we can look at them this way and that, chew over them, absorb and digest them.

Way No. 6 is to *impart to them the greatest possible degree of precision*. When studying the serial case interval, I wasted several valuable epidemics before I discovered that for each disease I had to find the best measuring-point, from and to which I must measure my interval.

Way No. 7, most important, write it in letters of gold above your bedstead: *Label, date and catalogue fully every piece of paper on which you make a record or do any working whatever*. I blush and shudder at my own delinquencies in this direction. Consecutive work and consecutive thought is impossible for us. How often have I been called away, as I thought for five minutes, from a late stage of a long piece of analysis, to return 3 or 6 weeks later to a piece of paper that had no meaning for me any more.

Way No. 8. Our methods will change as we gain experience of our problem. *Write down each method in full detail in a dated minute-book*. How I wish I had been taught this at the outset. Again and again we shall find ourselves asking "Now exactly, how am I doing this analysis?"

All this is, I fear, very humdrum, when there are many important things that can be said about research—about the passion for truth and accuracy, about humility and so forth—but all these have already been said far better than I could say them, and will I hope be said again. I will add one more, the ninth, to my list of "Ways". If our research were in the laboratory we should have shelves stocked with bottles of reagents, and to test our ideas we would simply lift the appropriate bottles down from the shelves; but we have no laboratory and it is well to understand what our reagents are. They are the rates and incidence of diseases painfully collected from our population over long periods. Suppose we are investigating a disease that we do not understand, and we wish to know

whether it is transmitted within the household and to what degree. Doubtless we would wish to compare it with other diseases whose behaviour we understand, for example, measles, chickenpox or mumps, so we lift down from the shelves our reagents, i.e., we take from our files the attack rates of these diseases to compare with the newcomer. *Let us, therefore, (Way No. 9) always attempt to express our results mathematically.* Clinical descriptions apart, we have not completed our investigation until it is quantitated. And here let it be clearly understood that my own mathematical equipment is most meagre, probably the poorest in this room. That is a hurdle I, in common with the rest of you research-workers, must be prepared to take. Fortunately a modest mathematical equipment suffices for most purposes. By the time more is needed we have probably moved out of our apprentice stage, and can call for Means—kindly statisticians and computing machines.

Means

I am not going to spend much time on Means. Not that they are unimportant. Far from it. I myself am deeply grateful for the help I have had and still receive. But each of us ought not to receive these extraneous helps until he knows more clearly than any outsider what he will require. Then he should consult with the research committee of the College or the Medical Research Council. The latter body will probably scrutinise his capabilities with care but with justice, and if convinced, will aid him nobly.

Research on the Common Cold

This is not the place and time to give results of new research, but I propose to illustrate the principles I have just enumerated by a brief account of a research still in progress on the common cold and its congeners.

The preliminary thinking about our approach to the problem occupied an inordinate time—several years. We were from 1947 studying measles, chickenpox and mumps, and all the time we asked ourselves, “How are the methods and results in these diseases applicable to the problems of undifferentiated respiratory disease?” And the apparently depressing reply came with monotonous regularity, “Not at all!” What were we to do? The answer was too obvious for us to recognise it at once. The answer was “One salient thing about the respiratory diseases is that they do not conform in any way to our detailed knowledge of such other common diseases as, for instance, measles”. We have therefore no right to apply to them any conceptions borrowed from other better-understood diseases. You may think this a meagre result for years of thought. We were not dissatisfied. We were alerted even for a mode of illness quite different from the patterns familiar to us. And so we

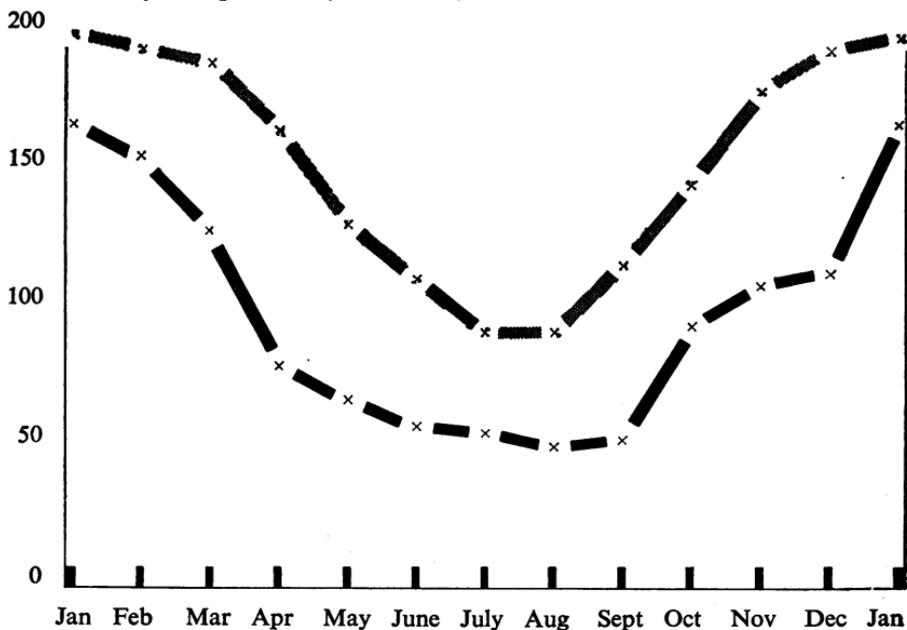
looked again long and dispassionately at our problem—the commonest disease of mankind. It seemed a formidable adversary. Measles is a common disease. Most of us suffer from it for a fortnight of our lives. The average person suffers from a cold for about 10 years.

Two other salient features went on record—they sound foolish enough baldly stated : Colds are very, very common. Colds are much commoner in winter. Everybody knows it—yes, but these are the salient features and we must be much more precise. Are colds really commoner in winter? How much commoner are they?

The only facts were the data of general practice. Figure 1 (black line) shows the average incidence of respiratory disease presenting in the practice over a period of six years. The figures are monthly and therefore crude, but they show clearly that the number of persons calling at the general practitioner's for colds etc., increases very much in winter.

Figure 1.
TEMPERATURE AND RESPIRATORY DISEASE.

Correspondence between the Average Monthly Figure for Respiratory Diseases seen in General Practice (black line) and the inversion of the Average Monthly Temperature (shaded line).

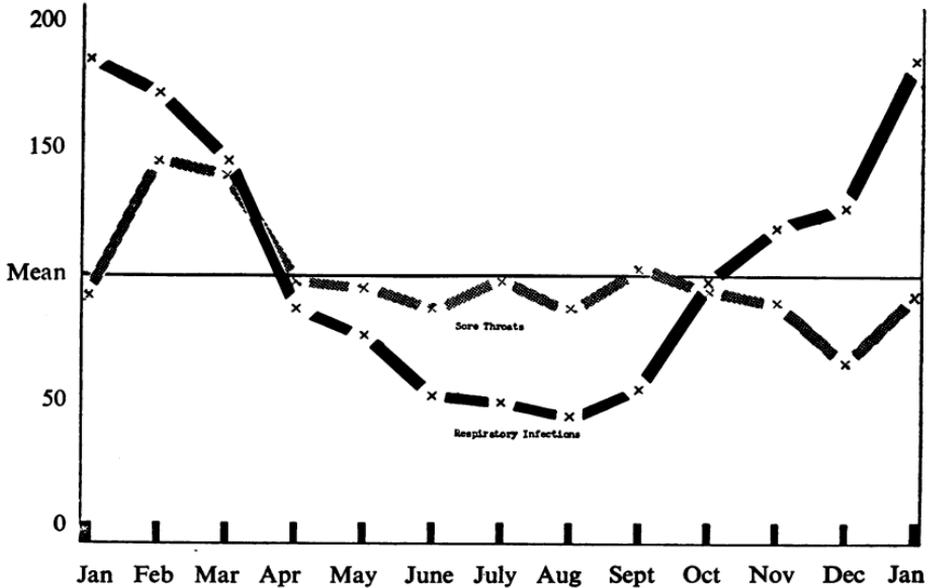


The other obvious thing that happens in winter is that the weather gets colder. Too obvious to mention perhaps. The shaded line in Figure 1 shows the average monthly temperature turned upside down. There is enough parallelism here to make a starting point.

We did one more analysis on the practice data. That respiratory disease line includes all sorts of disease—measles, whooping cough, etc.—that have nothing to do with the case: so we purged it. Having done so we asked ourselves “In this motley remainder, is there any symptom-group that we can isolate?” Yes. Diseases consisting entirely or mainly of sore throat are easily isolated. Figure 2 shows the expurgated respiratory diseases as a black line and the sore throats as a shaded line. Clearly the sore throats do not follow the classic seasonal line.

Figure 2.
SORE THROATS AND OTHER RESPIRATORY DISEASES

Difference in Seasonal Distribution between Sore Throats (shaded line) and other Respiratory Infections (black line) seen in General Practice. (Monthly Averages).



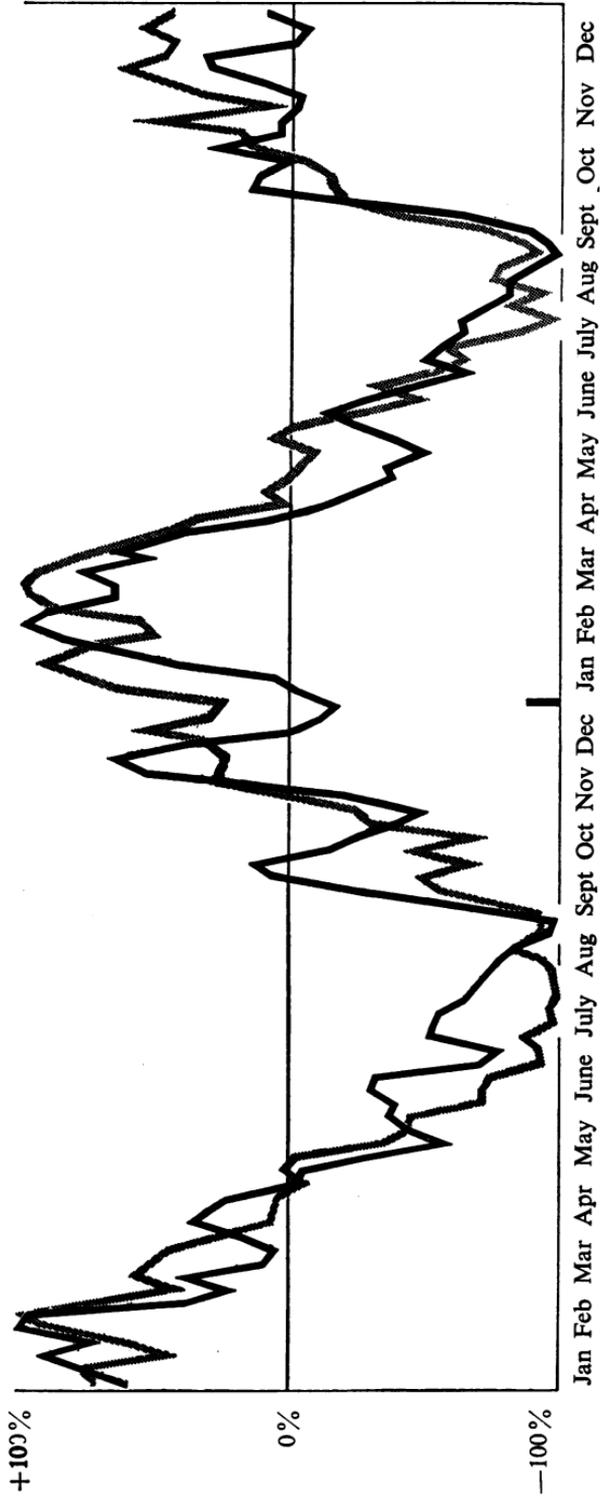
Well, here was a little progress. In this undifferentiated group most syndromes do, whilst some do not, have a winter tide. The time had come to add Means to our Ways and precision to our conceptions, and we began enrolling volunteers to keep a daily record of respiratory disease symptoms.

I should like to tell you how we selected and briefed the volunteers but time does not allow. The record-card was the result of months of cogitation and trial and error.

After two years of hard, dull, uninspiring work, we began our harvest. Colds are very, very common. I cannot give you all the

Figure 3.
MORBIDITY FROM COLDS WITH SEASONAL TEMPERATURE
1954 AND 1955.

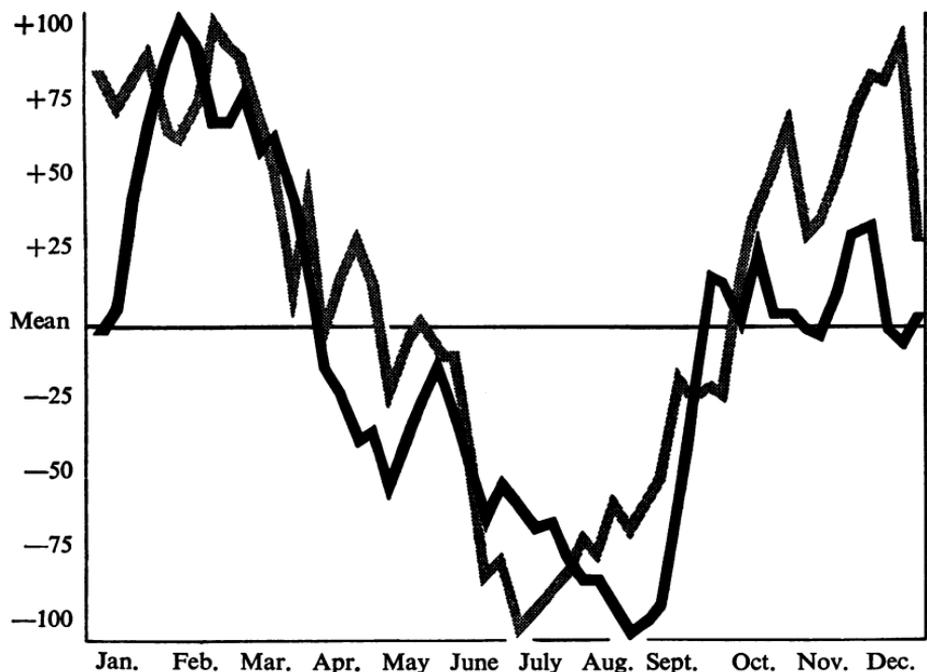
Percentage of Volunteers showing Symptoms (black line). Earth Temperature (inverted) (shaded line).



Jan Feb Mar Apr May June July Aug Sept Oct Nov Dec

Figure 4.
COLDS AND INDOOR DRYNESS, 1955

Morbidity from Colds (black line). Difference between Relative Humidity Outdoors and Indoors (shaded line).



statistics but these are interesting: there was an average of seven episodes of illness per annum per person; the average duration of illness was ten days. Seventy days per annum! Only 5% of them come to the notice of us as general practitioners.

The epidemiological nature of the illnesses differs profoundly from that of any others we have studied. There are two of the "salient features" confirmed. What about the third? Are colds really commoner in winter? Or are they only more severe so that the general practitioner sees more of them in winter?

Figure 3 shows the morbidity from colds amongst the volunteers during 1954 and 1955—the black line. By a very simple mathematical device I have made the changes in seasonal temperature of an exactly comparable scale with those of the morbidity and inverted them—the shaded line. The agreement between the two curves requires no statistical tests of significance. To us it was a moment of great excitement repaying months of drudgery, when first this astonishing correlation appeared. For each one degree Fahrenheit drop in temperature the morbidity rises 1%.

That curve is really only a beginning and I would ask you to look out for its sequel which is inside the long digestive process of medical journalism. It is clear, is it not, that the drop in seasonal temperature is unlikely itself to be a direct cause of the rise in morbidity. Few of us live in the outdoor temperature except in high summer. We must find another cause, acting directly on the human organism, and showing the same direct or inverse variations in intensity—almost certainly itself dependent on the seasonal temperature changes.

The hunt is on. I think we may already have caught our tiger. I had proposed to keep it up my sleeve for the present, but I feel now that that would be too tantalizing, so I will divulge that the shaded line on Figure 4 represents the dryness of the air that we inhale.

I hope that many of you are sharing and will continue to enjoy the excitement of the chase. There is much good game to be hunted in the medical jungle. I wish you good hunting.

III

SOME THOUGHTS ON RESEARCH

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I can claim no personal experience in general practitioner research, but a good deal has been happening during the past few years, as is evident from what we have heard today. Since the College of General Practitioners has been formed, I think there have been more original papers by general practitioners in the journals than there have ever been before. Four years ago the Medical Research Council set up a committee on research in general practice under the chairmanship of the late Sir James Spence, and as the present chairman of that committee, I am glad to note the emphasis made in this meeting, and in the last *Research Newsletter* on the difficulties, and the time that has to be spent in planning. I often feel that we do not get on very quickly in our M.R.C. committee. We have tackled one problem, and we feel that one problem at a time is sufficient, but the time spent is very considerable. I am relieved to know that others have found the same. I do not quite agree with Dr. Hope-Simpson that research does not make you a better doctor, but I do agree that you should be careful how you talk about it. "Research" is a word which tends to be highly charged, like "sex" or "Suez". Many people think that anyone doing research must be very clever, and that by implication those who do not undertake research are not so clever, and so those others like to make out that if you do research, you are not interested in people, or are not a good clinician.