

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.

So I advise general practitioners to talk about "an enquiry", instead of using the word "research".

### All Research Springs from Ideas

We have been told today and in the last *Research Newsletter* that there is no lack of problems. This is true, but they are not all ripe for investigation. Take for instance the cause of cancer—the most important problem that faces us today—what am I doing about it? Absolutely nothing, as I personally have no ideas which are as good as those of the people who are working on it at the present time. Some people are smitten with ideas which come to them at all times, in their baths and so on. Others do not have ideas so readily. Can we do anything to gain ideas? I think that keeping good records often helps. One may browse through them at a later date, and notice perhaps an extraordinary incidence of this or that and hence ideas may come. Some ideas may arise from peculiar coincidences—seeing three instances of the same thing in one week. The Doll and Hill investigation into the incidence of lung cancer in smokers may have arisen in this way. Some arise out of the crossing of two paths in one's mind, or of a train of thought in your own mind crossing with someones else's train of thought on quite a different line.

Sir Eric Ashby said to me the other day that he thought that the reason that Mendel did his great work when he did, and was not appreciated by the world for so long afterwards, was that until that time, botanists had been people who observed and recorded, and classified, and used their eyes, but were not people who measured things. Mendel was the first naturalist who was trained as a mathematician, and so, when he started growing things, he experimented with them and enumerated the results, and so worked out his theory of heredity. In a humble way I once wrote a paper on heredity in hypertension; the only new concept in the work was the attempt to distinguish between the family history of cases of essential hypertension and cases of secondary hypertension. It arose from a combined interest in genetics and in the aetiology of hypertension. One of the difficulties is, of course, that your material in general practice is very much more difficult to cope with than is ours in hospital. That is not a patronizing remark made to please general practitioners, it is just a fact.

### Observational Research

Darwin seldom measured anything. He was a naturalist of the old type and observed things about plants and animals. He went on his voyage, and saw, and thought. Mendel, on the other hand, was an experimentalist. Each of these men has influenced

biology enormously in his own way. The kind of medical research which relies on observation and record has been well worked out in many fields, and is bound to yield a diminishing return, and so, in order to do something more, we have to plan new methods of measuring, such as methods of estimating the blood levels of hormones. But in general practice many subjects have not yet reached this stage, and the methods of observation and record may still be applicable. There may even be dangers in trying to measure the unmeasurable. This I think has happened sometimes in psychological research. People have become so obsessed by measurement that they spend their time measuring what is trivial and irrelevant instead of observing what is real and important. Sometimes you can make a compromise, and, as Dr. Hope-Simpson has shown, you can get patients to estimate the severity of their own symptoms on a kind of numerical scale. The measles report was interesting in that nobody could really agree on what a catarrhal child was, but yet it came out quite clearly that any child classified as such by his doctor was more liable to develop complications.

#### **Prospect and Retrospect**

A good deal of research starts with that very useful instrument the retrospectroscope, and I suppose your former President's research in his practice in Yorkshire was really begun with this instrument, though I am not sure whether he was just keeping his records as a good doctor, or whether he was keeping them with an aim in mind. The retrospectroscope is a very valuable instrument, but in some fields of work it has distinct limitations, because, until you have grasped something, until you have got a clue or an idea, your records nearly always lack the relevant information. In the field of my own special interest for instance, it is now known that chronic pyelonephritis is a common cause of hypertension in the younger age-groups. Records made before that was realized will practically never give a history of urinary infection, because the right questions have not been asked. It is usually necessary to plan a prospective trial to confirm what you have found with your retrospectroscope, and this, of course, has been beautifully demonstrated by Doll and Bradford Hill's study of bronchial carcinoma.

#### **The Pilot Trial**

A pilot study should nearly always be undertaken over a small number of cases, so as to work out a method which you will be able to use. At the end of your pilot study, you have learned a great deal, and you will know whether you are likely to get worthwhile results. The Medical Research Council is open to support research on any subject, but, naturally, it goes very carefully into applications for assistance, and is far more impressed by

the person who can say "I have done this and that, and it looks as though things are turning out this way, and now I am requiring assistance", than by the untried applicant who says that he will do the work, if we will first give him the facilities.

### Some Illustrations

Finally I would like to pick some illustrations from recent researches. The results of the M.R.C. trials on poliomyelitis vaccine are only just coming in, and it would be wrong for me to give any indication of what they show. It may have seemed to some that it was premature to attempt this large scale investigation during 1956, but a big ethical problem was involved. The American trials had shown that the vaccine was likely to be successful, and by 1957 there would probably be enough vaccine for all volunteers and it would, therefore, not be ethical to withhold it from a control group. In 1956 there was still insufficient vaccine to go round, so that use had to be made of this opportunity. It was, of course, already known that you must never use as a control population the non-volunteers against the volunteers. There was a big trial of whooping-cough vaccine in America in which this mistake was made. The after-histories of the volunteers were compared with after-histories of children who had not been vaccinated, and they found that the vaccine protected them from street accidents, and skin diseases, and a host of other things, as well as whooping-cough. Of course the two populations were not comparable at all, the volunteers coming from better educated parents and more sheltered homes. I personally think that the opportunities for comparing active drugs with inert tablets and placebos are very few and far between in general practice, even if the patients enter the trial as volunteers. It is better to make use of controls which occur naturally. I thought that it was a nice way around the ethical problem in the measles trial to allow the doctors taking part to continue to use the treatment of their choice and to balance the results of one against the other. The Medical Research Council's investigation on the incidence and after-effects of otitis media—the results of which are not yet fully analysed—has shown that only about 1% of otitis media cases are sent to hospital at all. This alone shows how absolutely impossible it would be to do such an investigation, except in general practice, and how information about things of this kind may be known to general practitioners, but is certainly not known to the specialists who write most of the text books.

The other speakers in this morning's session have given examples of research actually conducted in general practice, and I have found their papers, and the subsequent discussions most stimulating. In compiling a more general talk on the subject, I hope I have not strayed too far from the realities of research in general practice.