had failed to stir the imagination of one's peers, to be told that despite ill-considered rejection one's submission had won the prize draw. At least some among the many who attend the crowded plenary sessions in anticipation of learning of the latest breakthrough in science will have their disappointment lessened on learning that their abstract, although rejected, was nevertheless the winner of the lottery prize.

Faced with the uncertainties in the support and conduct of research, the scientific community needs advice. The titles of the eagerly awaited paperbacks readily come to mind: "The Art of Funding for Scientific Research," "How I Made a Million in Research Grants"; for the less successful, "How to Continue Research on \$5 per Day"; for those getting on in years, "Research After Sixty"; and for the curious, "Everything You Have Always Wanted to Know About Research but Were Afraid to Ask."

If the picture described is somewhat confusing, at least we are fortunate that the level of support for research has not lagged too far behind the cost of living. The allocation of lottery funds to the health science centres in Ontario has been of great benefit as it has permitted new research space to be developed and major items of equipment to be acquired or renewed. Nevertheless, I hope that the uncertainties and vagaries in the support of research will also be recognised. Perhaps there needs to be more formal recognition that, in research, as in many human endeavours, the element of luck cannot be ignored. Although I am sure that the decision to allocate lottery funds to support health research was not guided by this principle, it is, nevertheless, very welcome, and recognises the many benefits to society arising from the conduct of health-related research. Although the prizes may not be as great, success in research can be just as pleasurable, and ultimately of potentially greater benefit.

Today's Treatment

Diseases of the respiratory system

Conclusions and problems

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The most important chest diseases and methods used in their treatment have been outlined in these articles. What can we conclude from them, and what are the outstanding problems? Our knowledge of the anatomy and physiology of the lungs has advanced tremendously in the past 20 or 30 years. It has been particularly gratifying to see how the knowledge gained from the study of pulmonary physiology has been applied to the study of disease processes. Many of the tests originally described by physiologists have now been applied to the assessment of pulmonary disability in patients. Nevertheless, it is perhaps still important to point out that many of the so-called pulmonary function tests currently in use are relatively crude and are likely to detect only widespread and fairly gross abnormalities throughout the lung. There have been recent advances using radio-isotopes to study regional pulmonary lung physiology, both as regards blood and air flows, and I hope that more will be done along these lines. We still badly need also a simple and reliable method of detecting early small airways obstruction. Several methods have been suggested but many of them have difficulties.

Use of drugs

ASTHMA

To turn to some of the specific conditions. The armament of drugs that we now have to treat asthma is impressive, and some

evidence suggests that doctors of all sorts are using these in a better manner. Nevertheless, sudden deaths from asthma still occur; what is more, they occur not only at home but in hospital. A further understanding of asthma and, more important still, education of the patients and the doctors looking after them are still important.

There have been changes in our concepts of asthma in recent years. The previous classification into "intrinsic" and "extrinsic" is now considered to be not so absolute as had been thought. Also, the importance of particular types of asthmatic, such as the "brittle" asthmatic or the "morning dipper," has been realised. The development of some of the drugs to treat asthma has not only been worth while in its own right, but has led to further important study of asthma and understanding of its basic mechanisms. Perhaps more than anything else the introduction of cromoglycate has done a tremendous amount to stimulate interest in, and understanding of, the mechanisms that produce asthma. Not only the very young and definitely allergic asthmatics respond to cromoglycate, but some of the older patients with intrinsic asthma may also do so. This is only one of the many facts that have tended to blur the previously clearly defined margin between these two types of asthma.

Other possible drugs for treating asthma have been introduced recently, including ipratropium. We have yet to see a useful prostaglandin of the "E" series, possibly because those already tried have proved irritant to the upper airways. Recurrence of interest in oral xanthine compounds in treating asthma is also occurring. However good the drugs are, the management of asthma must very much depend on the total care of the patient, which will rest in the hands of the doctor, his medical team, the patient, and the patient's family. Some form of early warning system is still necessary to alert the team that the patient is deteriorating, and home monitoring of pulmonary function by using instruments, such as the peak flow gauge or

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Vitalograph monitor, may be of great value. I hope that perhaps this will occur in a more widespread way in future.

CHRONIC BRONCHITIS

Our management of individual exacerbation of chronic bronchitis with or without respiratory failure has improved tremendously in recent years. Despite this, however, chronic bronchitis tends to take a severe toll of the population and is increasing dramatically in women at present. The most important problem here perhaps is to try and prevent bronchitis, firstly by supporting as strongly as possible antismoking campaigns, particularly in the young; and secondly, by attempting to treat prophylactically those patients with established bronchitis, and it is worthwhile remembering the value of an anti-flu injection each winter and also of chemoprophylaxis in appropriate cases.

The association of emphysema with α_1 -antitrypsin deficiency is interesting but has failed to explain the development of the illness in all cases. Bronchitis and emphysema, and other lung diseases, certainly result in producing many respiratory cripples. Perhaps we have not been as good as we might in Britain in rehabilitating such cripples. The use of oxygen at home or portable oxygen and home care services in such patients has been developed only in a few centres with enthusiastic local doctors. There is room for further improvement.

BRONCHIECTASIS

Bronchiectasis was said to be much on the decrease, but certain types of it are certainly claiming additional attention these days; in particular, adult physicians are more commonly coming across patients with cystic fibrosis, and, as Dr Hodson pointed out, many particular problems are attached to the care of such young people. Not the least of these is the transition from the paediatric to the adult physician. These young people often have remarkable insight into their illness, and much tact and understanding plus scrupulous attention to detail are important in their care. The choice of antimicrobial agents is certainly important but may be only secondary to the vital effect of skilled physiotherapy. Aminoglycoside antibiotics must be used with care, and there is possibly an argument for using tobramycin or amikacin as alternatives to gentamicin when they do have to be used.

Another particular type of bronchiectasis is that associated with allergic bronchopulmonary aspergillosis. This may be associated not only with severe episodes of infection but severe airways obstruction and lobar or segmental collapse of the lung, which may lead to a sudden dramatic increase in breathlessness and may even necessitate bronchoscopic aspiration of thick sticky plugs.

PNEUMONIA

The choice of agents in treating pneumonia is now wide, and fortunately most cases of pneumonia are treatable, except in the elderly or in those whose immune responses are being interfered with or tend to do badly. Staphylococcal pneumonia is a particular danger, as was indicated by Dr Ogilvie. Many physicians would prefer to use two antibiotics in treating such cases, and in addition to some synthetic penicillin drugs (such as flucloxacillin) or lincomycin, fusidic acid should be considered.

TUBERCULOSIS

The drugs available nowadays to treat tuberculosis are mostly effective and safe. The real problem lies in the ability of the physician and his team to ensure that patients take their treat-

ment for an adequate length of time and follow up patients and contacts at home. Unfortunately, this is not always done as well as it might be.

The use of drugs in surgical cases, which appear to be on the increase, should also be under the care of the chest physician since he is the person most likely to have knowledge of their dosage use and side effects.

BRONCHIAL CARCINOMA

The treatment of bronchial carcinoma still remains disappointing, whether by surgery or radiotherapy. We badly need to do two things here; firstly, to have intensive campaigns again against smoking to prevent carcinoma developing, and secondly, to try to develop some sort of effective and not too toxic drug regimen effective against such carcinoma. One might be able to develop some sort of multiple treatment comparable in some ways to the quadruple treatment used in lymphoma to deal with bronchial carcinoma.

UPPER RESPIRATORY TRACT INFECTIONS

Our use of drugs to deal with the symptoms associated with upper respiratory tract infections is empirical rather than scientific. Many anti-cold remedies contain alarming mixtures of drugs, often in homoeopathic doses. There is only really a good indication to suppress cough in particular circumstances, as I outlined in another article. More work is needed to establish the dose response curve of agents reputed to reduce cough since it may well be that noscapine or dextromethorphan will eventually replace codeine as a cough suppressant. It is generally agreed that mucolytic agents and expectorants are not really particularly valuable per se, and most chest physicians would agree on the importance of adequate hydration of patients plus physiotherapy in releasing tenacious sputum.

About one in five people in Britain die of chest disease so this is an important group of illnesses to prevent and treat. I wonder if over the next few years the accent will not move more from treatment to prevention. Thus adequate screening of immigrants and other populations susceptible to tuberculosis is an obvious move that could still be strengthened. The place of BCG vaccination may have to be reconsidered in the next few years since the likelihood of the native-born population developing tuberculosis is small, though the incidence may be 70 times or so greater in immigrants from the Asian subcontinent. As mentioned in Dr Hodson's article, the importance of immunisation against diphtheria and whooping cough should also be emphasised since the increase in whooping cough in recent years has led to several deaths among children. Immediate death is not the only danger, for bronchiectasis is a recognised long-term complication.

What is waterbrash?

Waterbrash is the sudden filling of the mouth with saliva, which is said to denote organic dyspepsia and particularly peptic ulceration. Some association has been noticed between it and hunger pain, but it is a rare symptom and the mechanism is unknown.

Correction

Chronic bronchitis

We regret that in the article by Dr Anne E Tattersfield (23 April, p 1124) a cough suppressant was incorrectly named. It should have read Actifed syrup.