25 postgraduates for a week, two or three times a year. The teachers at the latter should include some consultants working in academic and research departments. Already 172 doctors have attended such courses in Chelmsford.

The individual attachment doctors could also benefit considerably, in my view, from one or possibly two days spent observing the work and research of a near-by professorial obstetric unit. Clearly the future must lead to more formal academic links between the proposed regional postgraduate schools and their appropriate university teaching centres. Such linking would facilitate, and be facilitated by, the recognition of the regional hospital consultant as a teacher, holding either university status or a special position in the National Health Service. As any teacher, an obstetric consultant undertaking the work of a tutor should have a real vocation for teaching.

Research into Postgraduate Education

On first entering the field of postgraduate obstetric education for general practitioners I quickly became aware of the lack of information to guide me. The authority was there, being provided by the Ministry of Health, through the British Postgraduate Medical Federation. The Director of the Federation, Sir James Paterson Ross, has been a constant source of helpful advice and encouragement, and in this way has materially assisted me to expand both the resident practical and the lecture courses.

If the regional postgraduate schools of obstetrics become a reality, their teachers will have an enormous responsibility for the exchange of experience, information, and opinion. Regular meetings of these teachers for this purpose therefore are essential, and the consultants of undergraduate teaching schools will be able to offer special contributions to these meetings. In addition each regional hospital consultant undertaking teaching duties will need to accept an even greater responsibility to himself by attending obstetric and gynaecological meetings, congresses, and conferences—in order to remain constantly abreast of all modern developments arising from the academic research departments.

In the course of time the postgraduate teaching centres themselves would offer papers at these conferences and congresses, such papers as are based on their experiences, both clinical and educational. The total effect of this comprehensive proposal would inevitably raise existing standards, not only of domiciliary but also of hospital maternity services.

One last word: These ideas, while of particular relevance to the field of obstetrics, are possibly applicable to other specialties.

Summary

A brief account is given of the organization of postgraduate refresher courses in practical obstetrics for general practitioners. Some suggestions are offered for the wider provision of such courses, and a plea is made for more academic study of the problems of postgraduate medical education.

I am grateful to Dr. David Kerr, London, for his helpful criticisms and suggestions in preparing this paper.

INFLUENCE OF DIFFERENT SOURCES OF THERAPEUTIC INFORMATION ON PRESCRIBING BY GENERAL PRACTITIONERS

BY

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There are very few data available about the extent to which a doctor interprets and correlates his scientific information when he is applying it to the needs of individual patients. Much has been written about the value of postgraduate education for doctors, but, apart from some work on prescription records, the sources from which doctors obtain information about therapeutic innovations have not been investigated. Also, very little is known, outside of hospitals, about the incidence of the diseases for which this information is used, although some data are available from the incidence of notifiable diseases and the recent reports from the College of General Practitioners (1962).

During his undergraduate career a medical student receives instruction in the basic medical sciences and in clinical subjects. During his final years he is instructed in medical and surgical diagnoses and to a varied but limited extent in treatment. In some schools he is allowed to undertake treatment of individual patients under supervision in general practice. During his registration year the newly qualified doctor continues to receive instruction, and he is responsible, under supervision, for the treatment of patients, but thereafter the acquisition of any further medical knowledge is entirely dependent upon the interest and initiative of the doctor himself. The rapid advances in pharmacology have made a very large number of compounds available for medical treatment, but there is no necessity for a doctor to acquaint himself with any information about these new compounds; if he does attempt to do so, where and how he does this is wholly his own decision. The fact that compulsory medical education ceases one year after graduation from a medical school means that, though medical education may be one of the most important factors in determining the degree of success of any health service, doctors may avail themselves of parts only, or of none, of it during their postgraduate years.

In the present investigation the incidence of disease as diagnosed by a sample of general practitioners in Liverpool was examined during three one-week periods at the beginning of 1962. The practitioners were asked to record the sources from which they drew their knowledge when treating the diseases which they had diagnosed. The figures obtained from this investigation throw some light upon the most frequent diseases which a general practitioner is called upon to treat in a large urban area in the North of England, and they also show the extent to which his early medical education enables him to treat these diseases. In addition, a general practitioner may draw upon several other sources for his therapeutic knowledge when deciding upon treatment for individual patients. These other sources of knowledge had been determined by a pilot survey carried out in May, 1961, among a sample of Liverpool practitioners. It was found that those sources which were

included appeared to cover all the sources of therapeutic information which the general practitioners employed. They were carefully defined, and the doctors were able to select without difficulty the origin of the information about the items which they prescribed for individual patients.

Procedure in the Investigation

The investigation was carried out with the assistance of 39 doctors in general practice in the Liverpool area. As they were volunteers, the selection was not entirely random. However, the doctors' names were obtained from a list of Liverpool practitioners randomly chosen in the first instance. The practices were all in the National Health Service and very few private patients were involved in the inquiry. The representative nature of the sample is shown by the fact that the surgeries were widely dispersed throughout the city. Eight of the 39 doctors were in individual practices, and the remainder were in partnership. The distribution of doctors in single practices and in partnerships in this sample is typical of the distribution of doctors in practice in the Liverpool Executive Council area, as was the sex distribution of the participating practitioners.

The doctors were asked to decide from what source they derived their therapeutic knowledge when writing an item on a prescription. The final source of knowledge which they used when prescribing particular drugs for individual patients was requested; they were not asked where they obtained the knowledge for prescribing pharmacological groups of drugs. Each doctor was given a supply of forms on which to record his decisions. A row of diagnoses selected from those referred to by Backett, Heady, and Evans (1954) was printed horizontally along the top of the forms. These diagnoses were decided upon in discussion with Dr. Eimerl (1960), who had used a similar list in his study of prescribing in his own practice at Warrington. A list of the possible sources of a doctor's therapeutic knowledge was printed in a column down the left-hand side. A list of the items in the rows and columns and a reproduction of part of the form are shown in Table I and Fig. 1. Thus a practitioner was presented with a form containing 252 ¾-in. squares, each of which corresponded to a separate clinical condition and source of therapeutic knowledge. The doctors were asked to use the forms at every surgery for a period of a week, and to place a stroke in the appropriate square for every item which they prescribed. As soon as any one square contained the records of 50 items the doctor was asked to begin another form.

It had originally been planned that the investigation should be carried out with 42 practitioners during one week at the end of January. Owing, however, to pressure of the work in these practices, it was found necessary to carry out the investigation during the three one-week periods ending on January 27, February 3, and February 24, 1962. Eleven doctors filled in the forms during the first period, nine during the second period, and 19 during the final one. Of those who had originally volunteered to complete the forms, one changed his mind when the form was sent to him, and two others made mistakes in completing the forms, so their observations were discarded.

TABLE I.—*Lists of Headings Given on the Forms*

Row of Diagnoses Across Top of Form

Tonsils to trachea	Skin: sepsis
Otitis media	Skin: other
Nasopharynx, Coryza, etc.	Genito-urinary: male and female
Bronchitis	Pregnancy: natal, pre-, post-
Chronic bronchitis, Emphysema	Rheumatism, Neuralgia, Fibrositis
Pneumonia, Pleurisy	Arthritis, Joint injury
Heart disease	Cancer: all forms
Hypertension, Nephritis	Neuroses, functional disease
Varicose veins	Psychoses, schizoid depression
Alimentary infections	Senility
Peptic ulcer, Dyspepsia	Injuries and sequelae
Anaemia	Acute surgery
Influenza	Other symptoms
Acute specific fevers	Other disease

Column of Therapeutic Sources on Left-hand Side of Form

Medical training, including medical school, hospital, G.P. training	*Prescribers' Journal*
Consultant advice: letters and domiciliary visits	*Monthly Index of Medical Specialities (M.I.M.S.)*
Textbooks	Drug firms: calls by representatives, advertisements, reference cards
Periodical medical journals and articles	Discussion with general-practitioner colleagues
British National Formulary (B.N.F.)	

PROJECT ON PRESCRIBING:

DOCTOR'S NAME .....

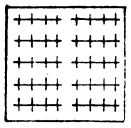
Instructions	Therapeutic Source	Tonsils to Trachea	Otitis Media	Nasopharynx, Coryza, etc.	Bronchitis	Chronic Bronchitis, Emphysema	
For every prescription put one or more bars in the square relevant to the disease and the therapeutic source of the prescription. After 4 bars (////), cross through for the fifth item, so that five items should be recorded as: ++++ A square will thus have the appearance:  A new sheet should be started as soon as square is filled.	Medical Training, including medical school, hospital, G.P. trainee						.....
	Consultant Advice: Letters and domiciliary visits						.....
	Textbooks						.....
	Periodical Medical Journals and Articles						.....
	British National Formulary (B.N.F)						.....
	Prescribers' Journal						.....
	M.I.M.S.						.....
	Drug Firms; Adverts. Reps., etc.						.....
	Discussion with G.P. colleagues						.....
		.....	.....	.....	.....	.....	.....
		.....	.....	.....	.....	.....	.....

FIG. 1.—Reproduction of part of the diagnosis-therapeutic source form.

Results of the Investigation

The total number of items prescribed for treatment of the diseases diagnosed by the doctors during each period is shown in Table II. It can be seen that the most frequently occurring diagnoses for which prescriptions were issued in Liverpool in January and February were bronchitis and diseases of the nasopharynx. A considerable number of prescriptions were also written for diseases in the tonsils and trachea, chronic bronchitis, influenza, rheumatism, and neuroses. The high incidence of respiratory diseases at

TABLE II.—*Numbers of Items Prescribed During the Three One-week Periods**

Period	No. of Doctors	Tonsils to Trachea	Otitis Media	Nasopharynx, Coryza, etc.	Bronchitis	Chronic Bronchitis, Emphysema	Pneumonia, Pleurisy	Heart Disease	Hypertension: Nephritis	Varicose Veins	Alimentary Infections	Peptic Ulcer Dyspepsia	Anaemia	Influenza	Acute Specific Fevers	Skin: Sepsis	Skin: Other	Genito-urinary	Pregnancy: Post-Natal, Pre-,	Rheumatism, Neuralgia, Fibrositis	Arthritis: Joint Injury	Neuroses, Functional Disease	Psychoses, Schizoid Depression	Senility	Injuries and Sequelae
1	11	102	51	280	284	87	16	52	56	4	40	43	31	250	4	51	111	37	79	105	55	115	34	2	33
2	9	54	22	194	159	86	9	56	36	10	60	67	43	83	5	45	52	49	46	72	51	92	23	3	18
3	19	280	94	308	350	252	8	118	76	24	79	80	98	90	17	126	117	114	98	242	47	255	51	10	65
Total	39	436	167	782	793	425	33	226	168	38	179	190	172	423	26	222	280	200	223	419	153	462	108	15	116

* The data refer to numbers of drug *items* on prescription forms.

this time of the year is usual in Liverpool. The incidence of influenza in Liverpool during the first period was particularly high; during the second period it was subsiding, and during the third and final period the doctors treated the normal seasonal illnesses.

Sources of Therapeutic Knowledge Related to Clinical Conditions

The extent to which the doctors recorded that they used the sources of knowledge during the three periods of the investigation are shown in Table III. The sources of knowledge which the individual doctors used and which they indicated on their forms have been combined for each of the three periods; they are shown in the table as percentages. The distribution of percentages of therapeutic sources were compared for all three periods; the differences in distribution were not significant ($P<0.05$). Although the incidence of disease during the three periods was different, and a separate group of doctors were involved during each period, it is apparent that they relied on very similar therapeutic sources for their prescribing.

TABLE III.—*Percentage Use of Therapeutic Sources During the Three Periods*

Period	Medical Training	Consultant Advice	Textbooks	Periodical Medical Journals and Articles	*B.N.F.*	*Prescribers' Journal*	*M.I.M.S.*	Drug Firms: Representatives, Advertisements	Discussion with G.P. Colleagues
1	40·1	6·2	1·6	6·3	16·2	0·4	1·0	22·7	5·4
2	25·4	9·7	2·1	3·6	19·9	0·5	6·1	30·6	2·2
3	33·0	11·5	3·3	6·8	13·0	0·6	3·2	22·5	6·0

By combining the three periods, the mean percentages for the sources of knowledge used for the treatment of different diseases by all the doctors in the investigation can be obtained. These percentages are shown in Table IV. This table shows the mean percentages of the numbers of items prescribed for each clinical conditions on the basis of the source of the knowledge which was used. Eight of the clinical conditions have been omitted from this table because a total of fewer than 15 items were prescribed in these categories during the three periods. No account was taken in the analysis of the items prescribed under "other symptoms" and "other disease," because these diagnoses were considered to be too imprecise. This table indicates that the sources from which the doctors admitted that they draw most of their knowledge when writing prescriptions were medical training, the *British National Formulary*, and the pharmaceutical industry through its representatives and postal communications about drugs. Consultant advice, textbooks, periodical medical journals, *M.I.M.S.*, and discussion with medical colleagues provided a much smaller proportion of the knowledge which was drawn upon for the writing of prescriptions except in the case of psychoses. The influence of the *Prescribers' Journal* was very small, but only five numbers had been published at the time of the investigation.

It is interesting to analyse the information in this table from the point of view of the clinical conditions for which the prescriptions were written. For example, for the treatment of heart disease the doctors relied predominantly on their medical training: 47.3% of the prescriptions for heart disease were attributed to this source of knowledge. Where this was apparently deficient the doctors relied on consultant advice (19.5%) or on the information provided by the drug firms (14.4%). The *B.N.F.* was not much used in this type of prescribing (5.3%). On the other hand, in the case of injuries and sequelae, when doctors also relied predominantly on their medical training (53.4%), they preferred as an alternative the *B.N.F.* (13.8%) to consultant advice (6.0%) but relied on information from the drug firms more than both these together (19.8%). For both these conditions the practitioners derived about 70% of their knowledge from medical training, consultant advice, and *B.N.F.* They used knowledge obtained mainly from the pharmaceutical industry for writing the remaining prescriptions for their patients.

For clinical conditions associated with bacterial infections, the drug firms provided a larger proportion of the

TABLE V.—*Percentage of Prescribing for Specific Clinical Conditions Due to Different Therapeutic Sources*

	Therapeutic Source								
	Medical Training	Consultant Advice	Textbooks	Periodical Medical Journals	*B.N.F.*	*Prescribers' Journal*	*M.I.M.S.*	Drug Firms	Discussion with G.P. Colleagues
Tonsils to trachea	22·7	12·3	4·0	4·4	15·2	1·9	3·1	29·2	6·4
Otitis media	30·2	9·5	3·3	6·6	9·4		1·9	36·8	2·2
Nasopharynx, coryza, etc.	35·6	4·0	0·6	3·1	28·2	0·1	5·3	17·7	5·4
Bronchitis	36·0	5·4	4·3	5·1	17·4	0·1	2·0	21·8	7·9
Chronic bronchitis, emphysema	31·2	4·8	2·2	6·1	20·0	0·4	3·8	26·6	4·9
Heart disease	47·3	19·5	2·2	8·8	5·3	0·8	0·8	14·4	0·8
Hypertension, nephritis	22·0	17·4	8·0	9·8	15·4	0·9	3·0	22·2	1·3
Alimentary infections	31·6	7·1	2·7	4·6	15·2	0·8	14·3	19·7	3·9
Peptic ulcer, dyspepsia	38·3	6·9	2·7	6·2	22·8	0	2·8	18·3	2·7
Anaemia	27·3	19·2	1·1	6·8	9·3	0·6	4·7	27·9	2·9
Influenza	31·3		3·0	3·0	37·1	0·8	2·2	17·2	5·5
Skin: sepsis	35·6	5·0	2·3	12·1	8·6	0·9	4·0	29·3	2·5
Skin: other	24·4	23·8	2·9	8·8	7·1	0	2·4	27·1	3·5
Genito-urinary: male and female	33·9	16·1	3·2	6·5	16·0	1·5	3·0	18·1	1·8
Pregnancy: natal, pre-, post-	41·0	3·8	2·8	14·3	23·0	0·7	0·7	13·2	0·3
Rheumatism, neuralgia, fibrositis	25·1	3·7	1·8	6·0	18·3	1·2	4·7	36·6	2·5
Arthritis, joint injury	39·9	12·4	2·0	4·0	9·2	0·7	5·2	24·0	2·6
Neuroses, functional disease	26·0	13·8	2·0	7·9	13·4	0·1	6·2	27·4	3·1
Psychoses, schizoid depression	16·0	44·7		8·3	9·5			19·0	2·6
Injuries and sequelae	53·4	6·0	2·6	1·7	13·8	0	1·7	19·8	0·8

information used by the doctors. This is probably because the pharmaceutical industry makes available a larger quantity of comparative information on this subject than any of the other sources. This is substantiated by a comparison with the figures recorded for the treatment of influenza. When prescribing for influenza the doctors relied on knowledge derived from their medical training (31.3%) and the *B.N.F.* (37.1%). Consultant advice was hardly used, and the industry was employed relatively little as a therapeutic source.

For the treatment of anaemia, genito-urinary diseases, and neuroses the general practitioners found their training to be relatively inadequate. Consultant advice was used more than usual and information obtained from the pharmaceutical industry was also employed to a large extent. When they were treating rheumatism, on the other hand, they made little use of consultants, and depended on the pharmaceutical industry for extra knowledge.

It is of interest to compare psychoses with the other clinical conditions. For psychoses, it is clear that practitioners used knowledge derived from medical training to a very limited extent: they usually called on consultant advice. For the diagnoses classified under "other skin diseases" and "psychoses, schizoid, depression" alone, the practitioners made greater use of consultant knowledge than of their own knowledge for the treatment of their patients.

Sources of Therapeutic Knowledge in Relation to Date of Graduation

The doctors were divided into three groups governed by the dates at which they were admitted to the *Medical Register*. Sixteen were admitted in 1951 to 1961; 12 in 1940 to 1950, and 11 before 1940. A chi-squared test was performed on the data with respect to the times of graduation, and the periods during which they completed their forms for the investigation; no significant difference was found between the times of graduation of the doctors in their distribution between the three periods ($P<0.05$).

The extent to which the three groups of doctors used the different sources of therapeutic knowledge when writing their prescriptions is shown in Fig. 2. The doctors in the oldest age-group used consultant advice least and also depended less than the other groups on discussion with their colleagues for making out their prescriptions. The most recently qualified doctors used the *B.N.F.* slightly more than the middle group, who used it slightly more than the doctors in the oldest group. By contrast, the most recently qualified doctors depended less on information derived from the pharmaceutical industry. The doctors in all the groups depended on textbooks, periodical medical journals, *Prescribers' Journal*, and *M.I.M.S.* together, only to about 10% for their therapeutic sources.

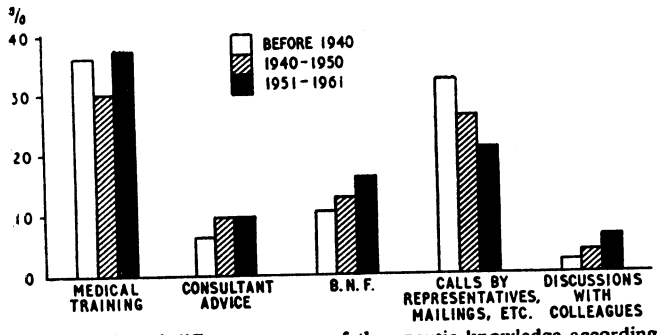


FIG. 2.—Use of different sources of therapeutic knowledge according to date of qualification.

Sources of Therapeutic Knowledge and Type of Practice

A comparison of the sources of knowledge used by doctors in single as opposed to multiple practices is shown in Table V. There was no significant difference in the age distribution of the doctors in these two types of practice ($P<0.05$). Doctors in single practice tended to use advice from consultants more and discussion with colleagues less than doctors in multiple practice, and these doctors also derived less knowledge from the pharmaceutical industry but more from the *B.N.F.* than their colleagues in partnership. It is, however, of interest to note that the sum of knowledge derived from the *B.N.F.* and the industry was the same in both types of practice.

TABLE V.—*Percentage Use of Source of Therapeutic Knowledge in Single and Multiple Practices*

Therapeutic Source	Single Practice	Multiple Practice
Medical training	27·2	34·9
Consultant advice	15·1	8·1
Textbooks	0·6	3·1
Periodicals	7·9	5·4
B.N.F.	23·6	13·3
Prescribers' Journal	0·8	0·5
M.I.M.S.	3·8	3·3
Drug firms	17·1	26·2
Discussion with colleagues	3·9	5·3
No. of doctors	8	31

Discussion

The results obtained in this investigation depend entirely on the subjective assessment by the doctors of the origins of their therapeutic knowledge. It may well be that this assessment is not entirely accurate, and it is not improbable that as a general practitioner becomes older and more experienced his memory of the exact origin of his therapeutic knowledge becomes less clearly defined. In these circumstances, however, the doctor will probably still be conscious concerning which sources he most frequently makes reference to when he wishes to employ a recently introduced drug.

It is reported that about 65% of all prescriptions in the British National Health Service were written for proprietary preparations (Ministry of Health, 1961). The doctors in our investigation indicated that they referred to the drug firms as a source of therapeutic information for a much smaller percentage than this. It is clear that though they may only have used the information from drug firms to this extent consciously they actually prescribed proprietaries more frequently when writing prescriptions for their patients. Since, however, some of the preparations prescribed under their official names are only available as proprietary preparations, it is probable that they are dispensed in this way without the doctors being aware of this. Also, since proprietary names are generally more familiar than official names, it may be that the doctors prescribe proprietaries without being conscious that they are actually doing so. There is not necessarily any direct relation between the extent to which the doctors stated that they used the individual sources of knowledge and the numbers of proprietary or non-proprietary drugs they actually prescribed. It will be realized that several of the sources of information from which the doctors drew when writing their prescriptions could lead them to prescribe both types of preparation; it is the relative influence of a proportion of these sources in combination which will finally determine the national total of proprietary or non-proprietary drugs which are prescribed.

Although these results are derived entirely from subjective assessments by the doctors, it is remarkable how similar they remained during the three different periods of the survey, and within the different age-groups of the doctors. This suggests that general practitioners tend, as a rule, to use the same therapeutic sources at different times and in the different conditions encountered in a large urban area. No objective attempt has been made to check their evidence, but in a related type of investigation Menzel, Coleman, and Katz (1959) found that the doctors' own statements correlate well with a search of prescription records.

The number of items prescribed per week is lower than a doctor normally prescribes because these results do not include prescriptions written during visits. Many doctors have arrangements in their surgeries that the receptionist fills in the E.C.10 forms for standard prescriptions; and the doctors check and sign them in between the admission of patients into their consulting-rooms. Such prescriptions were not included on the forms by some of the doctors who took part in the investigation.

When a medical student leaves medical school and teaching hospital, he has received only a basic knowledge of applied pharmacology and therapeutics. His therapeutic training in general practice will continue during his assistantship, but as he becomes more experienced he ceases to depend on textbooks and his superiors for his therapeutic knowledge, and information is derived from several sources, including discussion with his professional colleagues (Coleman, Menzel, and Katz, 1959). A general practitioner depends principally upon his medical training for the treatment of diseases in which no outstanding therapeutic advances have been made, and in which he obtains a thorough training in his undergraduate and early postgraduate period.

It is well known that medical training is deficient in the treatment of psychoses and non-bacterial skin diseases. Even though a medical student may be well trained in the anatomy and pharmacology of the autonomic nervous system, when he becomes a doctor this training is not adequate for him to treat hypertension with confidence. It is of interest to note that when a general practitioner was unable to deal with the treatment of heart disease himself he tended to refer his patient to a consultant and did not use the B.N.F. He used the B.N.F., however, in these circumstances, for the treatment of peptic ulcer. A general practitioner refers his patients for advice to a consultant to any significant extent only for the treatment of psychoses. General practitioners turned to the pharmaceutical industry for more than 20% of their therapeutic knowledge in a large number of diseases. The least extent to which they used the industry was in the management of pregnancy; for this condition they depended on the industry for only 13.2% of their knowledge.

Discussion with general-practitioner colleagues did not provide a high percentage of the information which doctors used in their prescribing. Coleman *et al.* (1959) discuss the influence of contacts with colleagues with reference to the rate of introduction of a new drug. They conclude that discussion between colleagues has a larger effect in influencing treatment where the treatment is subject to much trial and error. The outbreak of influenza in Liverpool would probably give rise to some dubiety about the best form of treatment; the best method for treatment of the associated respiratory infections would probably also be subject to some trial and error. It is therefore understandable that discussion between colleagues would be used as a therapeutic source in these particular diseases at this time of year.

Modell (1961) states that there are many thousands of medicaments in current use, and he suggests that doctors may be tempted to choose irrationally and irresponsibly among them. The importance of the influence which affects a choice between drugs for treatment of the diseases in patients is shown in Table VI. It can be seen that a doctor depends predominantly on the knowledge derived from his medical training in order to decide on the appropriate treatment for his patients. He uses this information to an extent of 33.8% for this treatment. He uses information derived from the pharmaceutical industry to a significant degree for the treatment of 60% of his patients' diseases, and he uses this source for about 28% of the treatment in these diseases. He refers to the *B.N.F.* for the treatment of only 20% and uses consultant advice for 15% of the diseases which he is called upon to treat. General practitioners use textbooks and periodical journals together less than 20% as a source of information for treatment in all the disease categories. In this investigation, doctors were not asked about the influence of postgraduate education, but from other concurrent inquiries it is clear that this has only a small effect. British general practitioners depend to a large extent on the pharmaceutical industry for information about advances in therapeutics which have occurred since their medical training ceased, and they use this information widely when prescribing for their patients.

TABLE VI.—*Influence of Sources of Therapeutic Knowledge on Treatment of Disease*

	Medical Training	Drug Firms	*B.N.F.*	Consultant Advice
No. of diseases* ..	19 (95%)	12 (60%)	4 (20%)	3 (15%)
Use of source† ..	33·8%	27·9%	26·3%	29·8%

* Diseases in which more than 20% of the information for treatment is derived from the named therapeutic source.
† Use of source in those diseases shown in top row.

Summary

An investigation was carried out during three one-week periods in January and February, 1962. In this investigation 39 doctors were asked to record the incidence of disease and the sources of therapeutic information which they used in determining the types of medication to prescribe. The doctors were asked to classify the diseases under 28 diagnoses and to decide from which of nine possible sources they derived their therapeutic knowledge when writing their prescriptions.

The most frequently occurring diagnoses for which prescriptions were issued were bronchitis and diseases of the nasopharynx. A considerable number of prescriptions were also written for diseases in the tonsils and trachea, chronic bronchitis, rheumatism, influenza, and neuroses.

Although during each of these periods the incidence of disease was different and a separate group of doctors was involved, all the doctors relied on the different sources to a similar extent for their prescribing. They stated that they derived most of their knowledge from medical training, the *British National Formulary,* and the pharmaceutical industry through its representatives and postal communications about drugs. Consultant advice, textbooks, periodical medical journals, *Monthly Index of Medical Specialities,* and discussion with medical colleagues provided a considerably smaller proportion of the information used for writing prescriptions, except in the case of psychoses.

For the analysis, the doctors were divided into three groups according to the dates at which they were admitted

to the medical register, and it was noted whether each doctor was in a single or multiple practice. Of the three groups, it was found that the most recently qualified doctors used the *B.N.F.* and discussions with medical colleagues as their therapeutic sources to a greater extent and information derived from the pharmaceutical industry to a less extent than their colleagues in the older age-groups. Doctors in the oldest age-group relied upon consultant advice and discussion with medical colleagues least of the age-groups. Doctors in single practice tended to use consultant advice and the B.N.F. more than their colleagues in multiple practice, but they depended less on discussion with medical colleagues for their therapeutic information. Practitioners in multiple practices relied to the larger extent on the pharmaceutical industry. In both types of practice the proportion of the information derived from the *B.N.F.* and the pharmaceutical industry together was the same.

Medical training, the pharmaceutical industry, the *B.N.F.*, and consultants were each employed to provide over 20% of the information which general practitioners needed for treating their patients. The influence of these sources of therapeutic information was most pronounced in the case of medical training, which was used for treating 95% of all diseases in their patients. Information from the drug industry was used for 60% of the diseases. The *B.N.F.* and consultant advice were used to any significant extent for treatment of only 20% and 15% of the diseases. It is clear that principals in general practice make extensive use of their early medical education in therapeutics, although this training is not always comprehensive enough for the treatment of several conditions. In general practice, doctors select from the information which is available for treatment of their patients, and their therapeutic knowledge is augmented from those sources which are most readily available to them in their surgeries.

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PATTERN OF PRESCRIBING IN GENERAL PRACTICE

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In a previous paper we (Wilson, Banks, Mapes, and Korte, 1963) described how the influence of different sources of therapeutic information could be measured and be related to the prescribing of a group of general practitioners in the Liverpool Executive Council area. After deciding upon their diagnoses, the doctors indicated from what source they drew their therapeutic knowledge when writing an item on a prescription. A form was provided for this purpose. Thirty-nine doctors were asked to do this during every surgery for a week at the end of January or during the first half of February in 1962. The present report presents the results of a second study carried out in October, 1962.

In the previous paper the importance of the different sources of knowledge was discussed in relation to the treatment of the diseases which the doctors diagnosed. In the present report figures have been obtained from the forms filled in by the doctors who took part in both studies in order to ascertain the relative importance of the different sources of therapeutic knowledge on their prescribing during these two seasons of the year. Other investigators have reported on the diagnoses made in general practice in different areas during particular periods (Backett, Shaw, and Evans, 1953 ; Backett, Heady, and Evans, 1954 ; Bloor, 1962 ; Eimerl, 1962 ; Research Committee of the Council of the College of General Practitioners, 1962), but there does not appear to be any published information about the incidence of disease in the same practices at different times during the year. The value of such temporal comparisons is pointed out in this paper, and the conclusions which can be drawn from them about the pattern of prescribing in general practice are discussed.

Procedure in the Investigation

This investigation was carried out with the co-operation of the same group of doctors and in the same way as the investigation previously described (Wilson *et al.*, 1963).

Thirty-two of the original 39 doctors took part in the second investigation, which was carried out in the early autumn of 1962, during the first three weeks of October. Of the seven doctors who were not included, two did not return their forms, two had left the area, and three could not participate because they were on holiday during the period of the investigation. Twenty-five of the doctors in the second investigation were in partnership and seven were in practice by themselves. The representative nature of the inquiry was not affected by the loss of these seven doctors, since the age and sex distributions of the remainder were still typical of the doctors in the Liverpool Executive Council area.

Results of the Investigation

There was no significant difference in the number of items written under the diagnoses during each of the three weekly periods in the autumn. The numbers of items prescribed for the different conditions are compared for February and October in Table I. There are significant differences in numbers recorded under the various diagnoses