Career Choice Within Medicine: A Study of One

MARY L. CHIPMAN, M.A.,* G. GRANT CLARKE, M.A.† and JAN W. STEINER, M.D., F.R.C.P.[C],‡
Toronto, Ont.

The types of careers chosen by medical students are of major importance to the communities they will serve and equally important to the medical schools that educate them. An understanding of the forces which determine these career choices can be approached either by studying factors operative in the community (needs and environmental influences) or in medical schools. The former method is still in its infancy, since only the crudest guidelines and empirical techniques are available to assess the impact of the community upon medical careers. Indeed, we harbour some doubts whether some of the much-touted assertions of "shortages" (such as of general practitioners) would withstand critical and objective scrutiny. Similarly, the role of undergraduate and postgraduate medical education in shaping career choices is little understood.

It is useful to view the career choices faced by medical students in the perspective of the history of medicine as a profession. The increase of specialization from the earliest days to the present, in recent years burgeoning at an alarming pace, needs no documentation here. This specialization has taken place in areas of study and practice, as well as in functions. The study and practice of medicine was first broken down into various scientific disciplines or clinical specialties, still further divided into sub-disciplines and sub-specialties, and most recently has been even further fragmented. Concurrently the functions of acquiring knowledge, transmitting it and putting it to use have been largely segmented into the roles of the researcher, teacher or clinician. Other developments in the organization of patient care have led to the varying styles of salaried, group and solo practice.

As a result of this specialization and diversification the term "doctor" (with its all-embracing connotation) has become virtually meaningless today. The above considerations imply that the individual who has chosen to become "a doctor" has taken only the first step in a series of decisions which will ultimately lead him to a specific place in the world of medicine. First, even before he enters medical school, he may "pre-specialize" by concentrating his premedical studies in one of a number of areas, such as biological science, engineering or behavioural science. Then, during medical school and after graduation he must make a number of more crucial choices: whether to enter general practice or begin training in a specialty, which specialty and subspecialty to choose, whether to teach and/or do research, what size of community to settle in, whether to join a medical school staff or undertake private practice, and so forth.

The diversification of the profession has complicated and compounded the task of the medical educator. It is now accepted that undergraduate medical education is only an initial step in training the highly differentiated doctor, and therefore curricula are being modified on the premise that the student cannot be taught everything he will ultimately require. Furthermore, the introduction of elective programs into undergraduate curricula reflects the need to provide the student with an early opportunity to explore the myriad of potential choices open to him.

More subtle factors are also involved in shaping the student's future. Even though the professed objective of a medical school may be the production of "undifferentiated doctors" or "generalists", the medical school environment—its size, setting, traditions and attitudes of staff and students—inevitably influences the student in more specific directions. Thus it becomes imperative to study and evaluate such latent influences in relation to community needs so that their potential may be harnessed to best advantage.

The present study is intended to throw some light upon these factors.

BACKGROUND AND OUTLINE OF LONGITUDINAL STUDY

The contributions of many biographical, psychological and academic factors which may be influential in determining career choice have been examined with groups of medical students,[1-4] interns and residents[5] or practising physicians[6] by investigators in the United States. The basis of many career choice studies is a growing concern for the future of family practice.[7-11] Some of these studies have been concerned with the number of general practitioners deciding to specialize at all stages of their medical careers,[12] and others have discussed the attitudes and values of medical students,[13-14] of whom increasing numbers enter specialty training within a few years of graduation. In Canada also, there have been several studies of medical students and registered physicians, and the present and future status of general practice have been subjects of much concern.[15-16]

*Formerly Research Statistician, Educational Research Unit, Faculty of Medicine, University of Toronto; presently Lecturer, Department of Preventive Medicine, Faculty of Medicine, Dalhousie University, Halifax, Nova Scotia.

†Formerly Director of Academic Services, Faculty of Medicine, University of Toronto; presently Research Associate, Committee of Presidents of Universities of Ontario, Toronto, Ontario.

Graduating Class at the University of Toronto

The methods of investigation used in these studies on the career choices of students and physicians have included personal interviews, psychological tests and questionnaires. Few attempts have been made, however, to trace the route that a doctor's career may follow from the time he graduates in medicine, possibly through postgraduate training, to the time he settles down to a career in some form of private practice, public service, research or teaching. As a partial approach to the study of the environment of the Faculty of Medicine in the University of Toronto, a longitudinal investigation of the careers of its graduates has been initiated, on the assumption that these individuals must perforce reflect many of the influences brought to bear upon them during their undergraduate training.

In the spring of 1966 the graduates of 1965 were surveyed by mailed questionnaire. The survey was repeated in 1967, adding the graduates of 1966 and the current final-year class, and in 1968 and 1969, adding the final-year classes of those years. Response rates obtained to date have been in the order of 90% (Table I). The investigation will be continued over a period of years, annually adding each new class and resurveying previous classes. This design will permit study of the extent to which perceptions and plans shift over the immediate postgraduation period. The present paper, however, reports only an analysis of the immediate career choices of the graduating class of 1965 as a baseline for further analyses as individual careers evolve.

‡Associate Dean–Student Affairs, Faculty of Medicine, University of Toronto, Toronto, Ontario.

Reprint requests to: Dr. J. W. Steiner, Associate Dean, Faculty of Medicine, University of Toronto, Toronto, Ontario.

OUTLINE OF THE PRESENT REPORT

Broadly speaking, recent medical graduates can be classified into one of three groups, defined by a particular "immediate career choice" (immediately following junior internship):

1. Doctors who enter general practice intending to remain in general practice permanently.
2. Doctors who enter general practice temporarily, intending to begin specialty training at a later date.
3. Doctors who enter specialty training at once.

The second of these groups seemed of particular interest. Financial conditions, family responsibilities, uncertainty whether to specialize, and doubt as to which of several fields to choose, are possible reasons for a doctor entering general practice temporarily before continuing with his training to become a specialist. This group of physicians can distort figures measuring the proportion of young doctors in general practice; as they enter specialty training their departure may deplete the ranks of general practitioners considerably. To discover how long the members of this group remain in general practice before specializing, and what proportion never, in fact, leave their practices to qualify as specialists, was a primary reason for beginning this longitudinal study.

The first questionnaires were sent to 1965 graduates six months after graduation. At this stage the intern's immediate career choice would have become relatively specific: residency, a research appointment, arrangements to join a group practice, and so on. In addition to these questionnaire responses, some biographical and academic performance data were available on each graduate from faculty records.

IMMEDIATE CAREER CHOICES

Of the 126 spring 1965 graduates, 116 responded to the questionnaire (92.1%). Of these, 19 (16.4%) intended to enter general practice permanently, 34 (29.3%) planned to enter general practice temporarily, and 63 (54.3%) intended to begin specialist training immediately. Since over five-sixths of the graduating class thus indicated specialty practice as their ultimate choice, it would be appropriate to characterize the University of Toronto environment as clearly favouring a specialist orientation. Nearly one-third of the class, however, gave specialty practice as their goal but intended to start their careers in general practice. Such individuals, although influenced before or during their medical education towards specialties, might be considered potential general practitioners. That is, sufficiently favourable experiences in general practice might induce them to remain in this field.

The present paper will focus on a number of variables potentially related to the three immediate career outcomes identified above. Variables to be examined include biographical factors, academic factors and interest in teaching and research.

BIOGRAPHICAL FACTORS

Data were available on the sex, age, premedical training and father's occupation of all 126 graduates. These variables have value as descriptive indicators and are useful for qualitative evaluation of this graduating class, whether or not they prove to be directly significant in career choice.

TABLE I.—Response Rates Obtained in Surveys Undertaken to Date

	Percentage response rates from class of:			
	1965	*1966*	*1967*	*1968*
Survey date	*N = 126*	*N = 157*	*N = 132*	*N = 179*
1966	92.1			
1967	92.8	91.7	99.2	
1968	91.3	94.3	89.4	96.6

TABLE II.—Age, Sex, Premedical Training and Father's Occupation of Respondents and Non-Respondents

	Age		Sex			Premedical training			Father's occupation				
	Median	No.	Male	Female	Total	Premedical course	Degree course	Total	M.D.	Other profession	Other occupation	Unknown, retired or deceased	Total
Respondents	25.9	116	102	14	116	83	33	116	14	27	69	6	116
Non-respondents	26.3	10	10	—	10	10	—	10	3	3	3	1	10
Total	25.9	126	112	14	126	93	33	126	17	30	72	7	126

Table II shows a comparison between the 116 respondents and 10 non-respondents in respect of these factors. All non-respondents were male and had been registered in the premedical course. However, since non-respondents represent only about 10% of graduates in these categories, this is not thought seriously to affect the results of the analysis below. Respondents only are analyzed in this section.

Table III presents a comparison of the immediate career choices of male and female graduates. The percentages in each category of immediate career choice appear similar; with so few cases a statistical testing was precluded.

Table IV classifies immediate career choices by premedical training. The majority of students who enter the four-year medical course have entered the premedical course two years previously from an Ontario secondary school. These students are relatively uniform with respect to age and academic background. The remainder have acquired university degrees in a variety of disciplines.

It is evident from Table IV that there are major differences in the career choices of premedical and degree-course students. While only one-tenth of premedical students give permanent general practice as their immediate career choice, one-third of degree-course students do so. Conversely, only two-fifths of degree-course students chose to enter specialist training immediately, while three-fifths of premedical students made this choice. There is little difference between the two groups in the percentages choosing temporary general practice.

Age is a variable which may in part explain these differences (Table V). The median age of degree-course students is nearly three years greater than that of the premedical students. Within the group choosing permanent general practice the difference is even greater. Although these differences are relatively small, they may, at this stage in life, be sufficient to make the older students less willing to undertake prolonged specialty training.

Another possible explanation for the difference in career choices between premedical and degree-course students may lie in the length of time they have thought of themselves as doctors. The premedical students could be characterized as "early choosers" (of medicine as a profession), and thus have had longer to work out specific career plans.

The occupations of the fathers of graduates were available only in broadly defined categories: doctors, members of other professions, and members of all other occupations. Such classification is of little use as an indicator of socioeconomic status but may represent broad differences in educational and other cultural influences. Graduates who as children had been exposed to the strong familial influences inherent in a medical environment, for instance, might be expected to display a different pattern of choice from the rest of the class. The distribution of career choices by father's occupation is shown on Table VI.

Those in this sample whose fathers are doctors display a different pattern of choice from the other groups. (This could not be tested statistically because of small expected frequencies in some cells of the table.) While there is no marked difference in choosing permanent general practice, there are proportionately fewer who choose temporary general practice and more who select immediate specialty training. Over three-quarters of those from medical families have chosen to begin training for a specialty, while only about one-half of those with non-medical fathers have done so. This finding might be explained in part by greater economic security which could enable those from medical families wishing to specialize to proceed with advanced training immediately upon graduation. Also, to the extent that the temporary general practice category represents uncertainty of career plans, such lack of certainty might be expected to be less in those who have a great deal of knowledge of the medical professions from early life.

The absence of other notable differences in Table VI may be due to the poor breakdown of fathers' occupations. The class of owners and managers, for instance, whose aspirations for their children and economic positions might be expected to be very similar to those of professional people, are included in the group of "other occupations" with "lower-status" occupations.

ACADEMIC FACTORS

It might be anticipated that academic factors would have great influence on the career choices of recent graduates. Good students are more likely to receive encouragement to continue their studies, and therefore are more likely to be interested in a career in teaching or research. Conversely, a greater proportion of students who do not receive such encouragement would likely enter general practice. The academic records of those choosing temporary general practice may also be of some interest: have these graduates records differing from those choosing to specialize immediately, or from those who decide to enter general practice permanently?

The academic performance of all graduates was examined in relation to their subsequent choices of career. It has already been demon-

TABLE III.—Immediate Career Choice by Sex

	Sex					
	Male		Female		Total	
Immediate career choice	No.	%	No.	%	No.	%
Permanent general practice	17	16.7	2	14.3	19	16.4
Temporary general practice	29	28.4	5	35.7	34	29.3
Specialty training	56	54.9	7	50.0	63	54.3
Total	102	100.0	14	100.0	116	100.0

Yearly Overall Average Marks

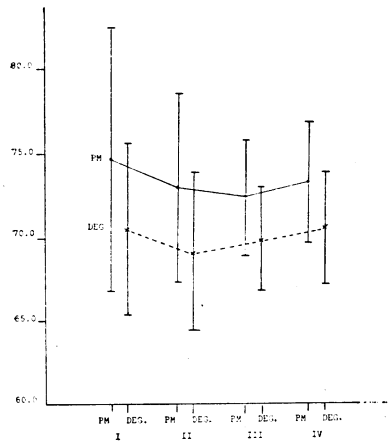

FIG. 1.—Comparison of academic achievement between "premedical" and "degree" backgrounds. Vertical bars represent one standard deviation.

strated that one academic factor, that of premedical training, has some effect on the career choice of graduates, possibly influenced by a difference in age. As shown in Fig. 1, premedical training is also related to subsequent academic performance in medical school; students originating from the premedical course had higher mean marks in all four years of the medical course.

Examination of academic performance in relation to immediate career choice (Table VII) indicates few marked differences between career choice groups. The overall pattern is a somewhat lower level of academic achievement among those choosing to enter permanent general practice following internship. Since these differences are small, however, it appears that academic performance is not a major factor in the determination of immediate career choice in the group under review.

TABLE IV.—Immediate Career Choice by Premedical Training

Immediate career choice	Premedical training: Premedical course No.	%	Degree course No.	%	Total No.	%
Permanent general practice	8*	9.6	11*	33.3	19	16.4
Temporary general practice	25	30.1	9	27.3	34	29.3
Specialty training	50	60.3	13	39.4	63	54.3
Total	83	100.0	33	100.0	116	100.0

* $X^2 = 8.08$, $P < .01$.

TABLE V.—Age* by Immediate Career Choice and Premedical Training

Immediate career choice	Premedical training: Premedical course Median age	No.	Degree course Median age	No.	Total Median age	No.
Permanent general practice	25.5	8	29.0	11	27.1	19
Temporary general practice	25.6	25	27.8	9	26.0	34
Specialty training	25.3	50	27.9	13	25.5	63
Total	25.4†	83	28.1†	33	25.9	116

*At December 31, 1966.
†Difference significant by sign test for difference of medians ($X^2 = 28.85$, $P < .001$).

TABLE VI.—Immediate Career Choice by Father's Occupation

Immediate career choice	Father's occupation: Medical doctor No.	%	Other profession No.	%	Other occupation No.	%	Unknown, retired or deceased No.	%	Total No.	%
Permanent general practice	1	7.1	4	14.8	12	17.4	2	33.3	19	16.4
Temporary general practice	2	14.3	11	40.7	19	27.5	2	33.3	34	29.3
Specialty training	11	78.6	12	44.5	38	55.1	2	33.3	63	54.3
Total	14	100.0	27	100.0	69	100.0	6	100.0	116	100.0

TABLE VIII.—Career Orientation by Immediate Career Choice and Premedical Training

Immediate career choice	Career orientation: Academic No.	%	Clinical No.	%	Total No.	%
Temporary general practice	17*	50.0	17*	50.0	34	100.0
Specialty training	46*	73.0	17*	27.0	63	100.0
Total	63	64.9	34	35.1	97	100.0

* $x^2 = 5.14$, $P < .05$.

TABLE IX.—Yearly Overall Average Marks by Immediate Career Choice and Career Orientation

Immediate career choice	No.	Academic year: I	II	III	IV
Specialty training:					
Clinical mean	18	72.0	69.9	70.9	71.2
Academic mean	43	75.7	74.1	72.8	73.8
Combined standard deviation		—*	5.74	3.63	3.47
Significance level†		—	.025	.10	.025
Temporary general practice:					
Clinical mean	18	73.2	71.6	71.2	71.9
Academic mean	16	73.2	71.5	71.4	72.8
Combined standard deviation		—*			2.83
Significant level†		—	Not significant t < 1 in all years		
Total	95				

*The degree of variation in first-year marks makes it impossible to attach significance to this difference.
†Two-tailed t-test.

TABLE X.—Specialty of First Choice by Immediate Career Choice

Specialty of first choice	Immediate career choice: Temporary General practice	Specialty training	Total
Basic science research*		4	4
Internal medicine	9	6	15
Pediatrics	5	3	8
Psychiatry	6	7	13
Other medical specialties†	3	10	13
General surgery	5	13	18
Obstetrics and gynecology	1	6	7
Other surgical specialties‡	5	14	19
Total	34	63	97

*Includes medical electronics (1).
†Includes anesthesia (3), dermatology (2), pathology (1) and radiology (7).
‡Includes cardiovascular and thoracic surgery (3), neurosurgery (3), ophthalmology (4), orthopedic surgery (5), otolaryngology (3) and plastic surgery (1).

TABLE VII.—Yearly Overall Average Marks by Immediate Career Choice and Premedical Training

Academic year / Immediate career choice	Premedical training: Premedical course I	II	III	IV	Degree course I	II	III	IV	Total I	II	III	IV
Permanent general practice												
No.	8	8	8	8	9	9	11	11	17	17	19	19
Mean	73.4	*69.8	71.0	72.5	67.5	67.2	68.8	*68.6†	70.2	68.4	69.7	70.3
Temporary general practice												
No.	25	25	25	25	8	8	9	9	33	33	34	34
Mean	73.4	72.0	71.7	72.6	72.8	70.1	70.2	71.6†	73.2	71.5	71.3	72.3
Specialty training												
No.	50	50	50	50	12	12	13	13	62	62	63	63
Mean	75.7	*74.1	73.0	73.7	70.1	68.1	69.6	*70.7	74.6	72.9	72.3	73.1
No response												
No.	6	6	7	7	2	2	3	3	8	8	10	10
Total												
No.	89	89	90	90	31	31	36	36	120	120	126	126
Mean	74.7	73.0	72.3	73.2	70.6	69.0	69.9	70.4	73.6	71.9	71.6	72.4

Note: Six students who failed do not have marks recorded as part of this class in first year or second year. This accounts for the discrepancies in the number of observations in each group.
* Significant difference (5%, two-tailed t-test) between permanent general practice and specialty training.
† Significant difference (5%, two-tailed t-test) between permanent general practice and temporary general practice.

INTEREST IN TEACHING AND RESEARCH

Another aspect of career choice which is related to many of the items already discussed is the graduates' interest in teaching and research. For doctors intending to remain in general practice permanently, opportunities to become involved in university teaching or research programs are very limited; consequently only doctors intending to specialize at some point in their careers are considered here.

Differences in career plans within the specialty-oriented group might conceivably be influenced by differences in interest in research, teaching and clinical practice. Table VIII shows the distribution of career orientations for doctors planning immediate specialty training or temporary general practice. To create a dichotomy, the doctors who have indicated any interest in teaching, research or some combination of the two are grouped together as doctors with "academic" interests, and the remainder are considered to have strictly "clinical" interests. There are no notable differences between these two groups in sex (not shown in Table VIII) or premedical training, but there is a significant difference between the proportion of doctors with clinical interests who have entered general practice temporarily and those who have begun specialist training. The strongest indicator of interest in academic careers is that most graduates with this intention enter specialty training as soon as possible. Of graduates choosing to spend a period of time in general practice, only 50% indicate an interest in research and teaching when they have specialist qualifications, whereas 73% of those choosing to specialize immediately intend to do some teaching or research in their careers. This difference may be due, in part, to the fact that the possibility of an academic career is more real to graduates whose training as specialists is not being delayed. Some of the doctors who postpone their specialty training may be sufficiently unsure whether they will, in fact, ever qualify as specialists, that they have not given serious consideration to the additional question of an academic career.

In Table IX the medical-school performance of graduates with academic orientations towards their careers is compared with that of their classmates intending to devote their time to private practice. Among graduates intending to specialize immediately, those with strictly clinical interests showed a significantly lower average academic performance in the latter years of medical school than those with academic interests. Among graduates choosing an interim period of general practice before beginning specialist training, there was little difference in grades between the academically and clinically oriented. The meaning of this finding is at present not clear.

The distribution of interest in various fields of specialization (indicated as first choice by all respondents intending to specialize) is shown in Table X, together with the number of doctors whose interests are either clinical or academic within each specialty. It is apparent from inspection that the widest fields—internal medicine and general surgery—are the most popular, and that fields such as internal medicine, pediatrics and psychiatry, which bear a close relationship to general practice, attract more doctors choosing temporary general practice as an immediate career choice.

DISCUSSION AND CONCLUSIONS

The preceding analysis of the initial steps in our longitudinal study of the career choices of successive cohorts of graduates shows that only a few major conclusions can be drawn at this stage. Publication of these results may seem premature, but we have considered the concept and the method of approach underlying this study sufficiently important to merit discussion. Longitudinal studies of this kind are few and far between,* and all results, positive or negative, may contribute to the more precise definition of relevant parameters.

*Notable exceptions are the Association of American Medical Colleges longitudinal study,[17] the Association of Canadian Medical Colleges student registry[18] and the Canadian medical school attrition studies.[19] We are not aware, however, of any studies employing a longitudinal method for the follow-up of graduates.

The following findings are of interest:

Over one-half of the respondents in this study declared their intention to specialize immediately following internship, and an additional third contemplated specialization after an initial period in general practice. Further, over one-half of all respondents (two-thirds of those contemplating specialization) expressed an interest in the academic aspects of a medical career. Assuming that these intentions are maintained and that responses will be consistent in future samples, it is clear that the type of student chosen for the medical course and/or the environment of the school favour a specialty career, with a strong emphasis on research and teaching.

The University of Toronto Faculty of Medicine has been redefining its objectives over the last several years, and changes in the educational environment have been planned. Knowledge of the present demonstrated bias toward specialization of student choices can assist in evaluating these objectives and provide a baseline for assessment of the effect of environmental changes on career choices. Furthermore, a longitudinal follow-up of the present cohort should give an indication of the stability of the initial postgraduation career choice. The degree of this stability may in itself be partially a function of the influence of the undergraduate environment.

It is not our intention to present a simple deterministic model. Although we would postulate a primary formative role for the influence of the undergraduate medical-school environment, the effects of this will be modified in many ways by the subsequent environments of hospital, community and, not least, the family. It was suggested earlier that the group who chose to begin their careers in general practice, but later to specialize, might still be thought of as potential general practitioners. It was further shown that the specialties which attracted them were for the most part those which have a close affinity with general practice. Such persons, by exposing themselves to the community en-

vironment of general practice, run the risk of being seduced by it, since a sufficiently favourable environment might induce a number to remain in "front-line" family care. Conversely, of course, it is by no means certain that the one-sixth of the class who intended to make their careers in general practice will remain. As this study continues, useful data on the effect of post-university environments should emerge.

Various biographical and academic factors were examined for their effects on immediate career choice. With respect to academic performance in medical school, it was noted that those subsequently choosing permanent general practice had obtained somewhat lower marks than those making other choices. Further, within the group choosing specialty training, the clinically oriented revealed a lower level of academic performance than those oriented towards research and teaching.

The most notable factor which was found to affect immediate career choice was premedical training. Those students from degree courses were proportionately more likely to choose permanent general practice than those from the premedical course. Much of this difference, however, can be explained in terms of the differing characteristics of these two groups; students from degree courses were older and showed consistently lower academic achievement in the medical course.

Each medical school is characterized by the career interests of its graduates. These interests reflect the curriculum of the school, the attitudes of its faculty members and the external environment of the medical school—which includes not only the university but the community from which most of its graduates have come. It is evident that the medical school in the University of Toronto is characterized by a strong interest in research and teaching. Approximately two-thirds of those intending to specialize eventually are interested in these academic aspects of a medical career. Presumably this reflection will become blurred with time: influence of medical-school attitudes decreases as new and more relevant experiences in hospital residencies, research laboratories and private practice make themselves felt.

Medicine can no longer be regarded as one profession but as a conglomerate of many highly specialized professions. The term "medical doctor" must be replaced by more specific descriptions like "cardiovascular surgeon", "dermatologist", "general practitioner" and "biomedical engineer". The doctors in each of these fields may once have been classmates; their medical school must recognize the part it played in the career choice of each one. Continued study of the patterns of change as "immediate career choice" is crystallized into "ultimate career choice" should aid in understanding the characteristics and aims of a medical school and of its graduates. Such understanding is vital to the evaluation of its contributions to the medical profession.

REFERENCES

1. BRUHN, J. G. AND PARSONS, O. A.: *J. Med. Educ.*, 39: 40, 1964.
2. GEE, H. H. AND GLASER, R. J., editors: *Ibid.*, 33 (suppl.): 1, October (Part 2), 1958.
3. PETERSON, O. L. *et al.*: *New Eng. J. Med.*, 269: 1174, 1963.
4. SCHUMACHER, C. F.: *J. Med. Educ.*, 39: 278, 1964.
5. KRITZER, H. AND ZIMET, C. N.: *Ibid.*, 42: 47, 1967.
6. WEISKOTTEN, H. G. *et al.*: *Ibid.*, 35: 1071, 1960.
7. CLUTE, K. F. General practitioner; a study of medical education and practice in Ontario and Nova Scotia. University of Toronto Press, Toronto, 1963.
8. HAGGERTY, R. J.: *J. A. M. A.*, 185: 179, 1963.
9. WHITE, K. L.: *J. Med. Educ.*, 39: 333, 1964.
10. WOLF, G. A.: *Ibid.*, 40: 737, 1965.
11. SEVERINGHAUS, A. E.: *Ibid.*, 40: 721, 1965.
12. WEISKOTTEN, H. G.: *J. A. M. A.*, 176: 895, 1961.
13. CAHALAN, D., COLLETTE, P. AND HILMAR, N. A.: *J. Med. Educ.*, 32: 557, 1957.
14. HUTCHINS, E. B.: Career attitudes of medical students at the University of Toronto. Speech given at the March 31, 1967 meeting of the Faculty Council of the Faculty of Medicine, University of Toronto. Unpublished address.
15. MCAULEY, R. G.: *Canad. Med. Ass. J.*, 96: 1036, 1967.
16. MOUNT, J. H. AND FISH, D. G.: *Ibid.*, 94: 723, 1966.
17. JOHNSON, D. G. AND HUTCHINS, E. B.: *J. Med. Educ.*, 41: 1097, 1966.
18. FISH, D. G.: *Canad. Med. Ass. J.*, 92: 694, 1965.
19. ANDERSON, D. O. AND RICHES, E.: *Ibid.*, 96: 665, 1967.

GUIDANCE TO CONTRIBUTORS

Manuscripts

. . . . . All material intended for publication should be submitted to the Editor at the editorial office of the Journal, 129 Adelaide Street West, Toronto 110, Ontario, with a covering letter requesting consideration for publication in the Journal. Acceptance is subject to the understanding that such material is submitted solely to this Journal, and will not be reprinted without the consent of both the Editor and the author. The Editor reserves the right to make such editorial changes as are considered necessary to ensure correctness of grammar, clarification of obscurities or conformity to Journal style. Articles should be typed, double-spaced, on paper 8½" x 11".

References

. . . . . References should be limited to the minimum necessary and must be referred to by number in the text. These should include in order: the author's name and initials, in capital letters; abbreviated journal name; volume number, page number and year. The abbreviations of journal names should be those defined in the *Index Medicus* of The National Library of Medicine, Washington, D.C.: e.g. 8. Willis, W. H.: *Canad. Med Ass. J.*, 88: 411, 1963. References to books should include in order: author's name and initials; title of book, number of edition (if 2nd or 3rd, etc.); name of publishing house; city of publication, year of publication; page number (if a specific reference): e.g. 9. Underhill, F.: A textbook of medicine, 2nd ed., Jones & Jones Ltd., London, 1962, p. 1376.

Illustrations

. . . . . Illustrations and tables should be sent detached from the manuscript. Illustrations, both half-tone and line, should be referred to as "Figures" and numbered in Arabic numerals. Tables should be numbered in Roman numerals. Each figure and each table must be accompanied by an explanatory legend, and the name(s) of the author(s) should be written on the reverse side. Separate sheets should be used for each table and illustration and for legends. Photographs should be glossy prints, unmounted and untrimmed, preferably not larger than 8" wide and 10" deep. The "top" of photographs, radiographs and photomicrographs should be indicated on the reverse side. Colour work can be published only at the author's expense. Magnification of photomicrographs must always be given. Patients must not be recognizable in illustrations, unless written consent has been obtained and supplied with the manuscript. Graphs and diagrams should be drawn in India ink.