

A Comparative Study of the Subsequent Careers of Applicants for Postdoctoral Research Fellowships in the Medical Sciences¹

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THE ROCKEFELLER FOUNDATION established a program of Fellowships in the Medical Sciences, in 1922, under the administration of the Medical Fellowship Board, National Research Council. As a preliminary step toward evaluation of this program, a survey has been made of the careers of persons who applied for these awards during the period 1922-1941.

The fellowships were designed to provide experience at the postdoctoral level for individuals with promise in research and teaching. It was anticipated that fellows would undertake academic careers and would play an important role in the development of future investigators. Consequently, the evaluation was based on the question: Do past fellows differ significantly from declined applicants with respect to subsequent success in academic work and research, as indicated by the positions they now hold?

After preliminary analysis, several objective criteria were selected. While it was recognized that no one of these alone would be a wholly satisfactory index, if taken in combination, they should serve as the best available yardstick. These criteria are:

- (1) Inclusion in *American Men of Science*.
- (2) Listing by the Medical Sciences Information Exchange. The Exchange was established in 1946 by the U.S. Public Health Service and was transferred to the National Research Council in 1950. When this record was consulted late in 1951, it included data concerning research grants awarded since 1946 by the six governmental agencies concerned with medical and biological research, and by some fifty private foundations operating in these fields. The proportion of fellows and declined applicants who were principal investigators under the grants was determined.
- (3) University positions. This includes all individuals holding part-time or full-time clinical or academic appointments. The following categories of full-time university work (with clinical appointments eliminated) also were analyzed: (a) academic positions (including all ranks); (b) professorships; (c) senior academic positions (deans, heads of departments, professors, and associate professors).
- (4) Private practice. This negative criterion was

analyzed in terms of the proportions of the two groups in full-time practice, whether or not they held other appointments as well. The group in practice without concurrent university appointment also was considered separately.

Questionnaires covering items 3 and 4 were sent to all of the 1136 persons who applied during the period studied. The analysis was limited to the 998 individuals, 88%, who responded.

Past fellows and declined applicants were compared with respect to the criteria by determining the significance of the difference between the proportion of each group falling in a given response category. The technique recommended by McNemar³ for dealing with the difference between independent proportions was followed. Yates' correction was applied to all computations. A probability level of 0.01 or less was accepted as representing a significant difference.

The results obtained for the total sample of past fellows and declined applicants are shown in Table 1. For all criteria, the differences between the two groups are highly significant and are in the direction that suggests that past fellows surpass declined candidates with respect to these indices.

The results were essentially the same when past fellows and declined applicants working in the clin-

TABLE 1
COMPARISON OF THE CAREERS OF THE TOTAL GROUPS OF PAST FELLOWS AND DECLINED APPLICANTS^{*}

	Fellows (N = 265)		Applicants declined (N = 707)		P*
	f	%	f	%	
Men of Science	221	83.4	331	46.8	< 0.001
Medical Sciences Information Exchange	114	43.0	137	19.4	< 0.001
University appointments	197	74.3	396	56.0	< 0.001
Academic positions	115	43.4	185	26.2	< 0.001
Professorships	49	18.5	54	7.6	< 0.001
Senior academic positions	104	39.3	140	19.8	< 0.001
Practice	35	13.2	195	27.6	< 0.001
Without concurrent university appointment	15	5.7	118	16.7	< 0.001

* P = the probability that a difference of the magnitude indicated would occur as the result of chance factors alone.

³ Quinn McNemar, *Psychological Statistics*, p. 76. New York: Wiley. (1949).

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TABLE 2

COMPARISON OF THE CAREERS OF PAST FELLOWS AND DECLINED APPLICANTS NOW WORKING IN PRECLINICAL FIELDS

	Fellows (<i>N</i> = 124)		Applicants declined (<i>N</i> = 257)		<i>P</i>
	<i>f</i>	%	<i>f</i>	%	
Men of Science	117	94.4	205	79.8	< 0.001
Medical Science Information Exchange	65	52.4	79	30.7	< 0.001
University appointments	92	74.2	150	58.4	< 0.01
Academic positions	79	63.7	131	51.0	< 0.05
Professorships	29	23.4	38	14.8	> 0.05
Senior academic positions	70	56.5	99	38.5	< 0.01

ical area were compared. Again all probability values were less than 0.001. The evidence in the preclinical sector is less clear-cut, as indicated in Table 2. Two of the six pertinent indices, academic positions and professorships, failed to distinguish between fellows and declined applicants.

This trend away from true differences between fellows and declined candidates in the preclinical fields was borne out when specific fields of interest were analyzed separately. In evaluating this finding, it is important to note that the total preclinical group (including all applicants) surpassed the combined clinical group on five of the six criteria.

The declined applicants who had held fellowships under other auspices were compared with those who had not, and the results are presented in Table 3.

A significantly larger proportion of those who had held other fellowships than of those who had held no other fellowships was listed by the Medical Sciences Information Exchange. No other significant differences were found.

Table 4 compares the declined applicants who had held other awards with the total group of past fellows.

TABLE 3

COMPARISON OF THE CAREERS OF DECLINED APPLICANTS WHO HELD FELLOWSHIPS UNDER OTHER AUSPICES AND THOSE WHO DID NOT

	Held other fellow- ships (<i>N</i> = 274)		Held no other fellow- ships (<i>N</i> = 433)		<i>P</i>
	<i>f</i>	%	<i>f</i>	%	
Men of Science	136	49.6	195	45.0	> 0.05
Medical Sciences Information Exchange	67	24.5	70	16.2	< 0.01
University appointments	168	61.3	228	52.7	< 0.05
Academic positions	81	29.6	104	24.0	> 0.05
Professorships	22	8.0	32	7.4	> 0.05
Senior academic positions	61	22.3	79	18.2	> 0.05
Practice	74	27.0	121	27.9	> 0.05
Without concurrent university appointment	38	13.9	80	18.5	> 0.05

TABLE 4

COMPARISON OF THE CAREERS OF THE TOTAL GROUP OF PAST FELLOWS WITH THOSE OF THE DECLINED APPLICANTS WHO HELD FELLOWSHIPS UNDER OTHER AUSPICES

	Fellows (<i>N</i> = 265)		Declined applicants who held other fel- lowships (<i>N</i> = 274)		<i>P</i>
	<i>f</i>	%	<i>f</i>	%	
Men of Science	221	83.4	136	49.6	< 0.001
Medical Sciences Information Exchange	114	43.0	67	24.5	< 0.001
University appointments	197	74.3	168	61.3	< 0.01
Academic positions	115	43.4	81	29.6	< 0.01
Professorships	49	18.5	22	8.0	< 0.001
Senior academic positions	104	39.3	61	22.3	< 0.001
Practice	35	13.2	74	27.0	< 0.001
Without concurrent university appointment	15	5.7	38	13.9	< 0.01

The differences between these two groups were significant in every category, providing a clear-cut contrast with Table 3.

The elimination of women from the total group did not alter essentially the results shown in Table 1. When factors of age and selection ratio were held constant, the relative standing of fellows and declined candidates with respect to the eight criteria was unchanged.

Analysis of the universities in which the two groups held positions indicates that both fellows and declined candidates have obtained appointments in the major universities in this country.

Two principal conclusions were drawn. (1) To the extent that the criteria selected reflect the purpose of the fellowships, the program as a whole has been effective in selecting personnel with potentialities of leadership in medical investigation and teaching, and in providing opportunity for development of these abilities. It is recognized that the selection process, the fellowship opportunity, and, possibly, the prestige of the fellowship may all have been contributing factors. At the present stage of the research it is impossible to assess their relative importance.

(2) There is need for development of additional criteria of success in research and academic work. Table 2 indicates a relatively high standing for both fellows and declined applicants with respect to the criteria selected. This may well be related to the fact that the opportunities outside the academic field are more numerous and more tempting for men with clinical training than for those holding the doctorate in one of the basic medical sciences. The question arises, therefore, as to whether the criteria used are adequate indices of success in the preclinical field. A complete evaluation of this and similar programs, particularly in the basic sciences, will be dependent upon availability of finer indices and upon further research.