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MIGRATION FROM DEVELOPED COUNTRIES:
THE CASE OF BRITAIN

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Preface

"Children of Britain matriculate: You have nothing to sell but your brains".

So says Professor P. M. S. Blackett (1963) and the "talented children" of Britain have been taking his advice in ever-increasing numbers. British scientists and other professionals have been developing their talents and selling them on the world-talent market in numbers which have, rather belatedly, concerned (amongst others) the British Government, many educators, the Royal Society and the heads of the D.S.I.R. scientific establishments in Britain.

Britain - having lost an Empire rich in raw materials, labour and markets, she herself lacking in basic raw materials, unable to raise more than half of her own food - increasingly must live on her wits: Britain's largest and most valuable national resource is the talent - the skill of her people. It has been clear since the middle 1950's that one of the major potential threats to the British talent-pool has been the loss through emigration of well-educated and well-trained scientists, physicians, academics, graduate students, engineers, technologists, and other professionals.

The search at hand was an exploratory effort to ascertain the extent of the loss in relation to present statistics available; to verify that which was available and to seek out, identify, and question a large sample of British migrants in North America. Then, their responses were compiled, interpreted, and an attempt made to find the meaning and significance behind the migratory behavior.

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Introduction

This investigation was an exploratory study within the general field of the Social Psychology of Emigration. Specifically, it concerns British migrant scientists and other British professionals migrating to North America during the last decade or so. The inspiration for the present research was provided by the Royal Society, which in 1963 published a quantitative analysis of the contemporary flow of British scientific and engineering talent - all with Ph.D.s - from the United Kingdom. The purpose of the present research was to extend, as possible, the quantitative and qualitative aspects of this Royal Society Report, which was entitled, Emigration of Scientists from the United Kingdom.

Scientists have always been migrants and Britain has for many centuries been an emigrant nation. However, during the early and middle 1950's, articles and letters began to appear in the popular press and in professional journals that discussed the possibility that this flow of professional, scientific, academic, and technical talent was more than Britain could now bear, that it was increasing, and that it included some of the more gifted persons now being produced in Britain.

It was hypothesized that British scientists and other professionals were being attracted or "pulled" into North America by the greater professional and economic opportunities available there. It was also alleged that these scientists and professionals were being "pushed" out from Britain by the lack, relatively speaking, of funds, equipment, facilities, scientific enthusiasm, and a lower standard of living. It had been suggested that, in fact, North America, and especially, the USA had become a "magnet" attracting scholars, scientists, and professionals from all over the world, that this was a generalized pattern of talent-loss that was now involving Britain.

In addition, it was felt that while perhaps as many as one-half of the migrants eventually returned to Britain, many remained overseas for the whole of their professional careers. This loss of excellently trained scientists and professionals was difficult to bear in the first instance because the cost of educating them had been borne - in the main - by the whole society. That many of those lost to British Government science establishments, universities, and industry and were destined for a competing socio-economic complex was highly disconcerting. That the flow of outward-bound scientists and others was on the increase and appeared to be unbalanced by any significant return flow of North American talent, and that it included some recognized national names, added fuel to the controversy.

The present investigation set out to find, in a word, who the British migrant scientists were, in the sense of social, economic, and professional background, why they had left Britain, when had they emigrated, where they settled in North America, what sort of work were they now doing, how satisfied they were with their original decision to emigrate, and what their intentions were concerning the future. We were interested in why many - perhaps one-half - of the departing British scientists had chosen North America, and we were interested to ascertain if the quantitative materials in the well-known Royal Society Report (1963) could be substantiated from sources other than the British Universities which had been the Royal Society's source for their report.

The purpose of the research was not to make an exhaustive study of the "causes" of emigration among contemporary British professionals; this would have demanded more extensive sociological, demographic, and penetrative psychological methods - for which funds and time did not then exist.

Aside from the now-famous Royal Society Report and a few informal and popular surveys, up to 1964, literally nothing of scientific significance had been accomplished in the area as such; the critical need now was for a body of facts and information upon which others, including the author, could build. The technique was to explore what literature existed concerning this issue, to validate the statistics which did exist by checking that which was available on the alternate side of the Atlantic, but mainly, to go to the migrants and allow them to speak for themselves. An effort was mounted to locate a sufficient number of migrants in order to construct a valid sample, to identify them, and then to question them via an empirical instrument and to ascertain, by means of theme-analysis and sample statistics, any general and specific trends or patterns concerning basis for self-selection, social grouping, motivations, and intentions for the future. Naturally, we were interested in the question of causation but were modest in our expectations about being able to offer definitive answers in this regard. However, the causes of, and reasons for, emigration, as found in the press and professional journals and in Parliamentary speeches could be tested, if only to minimal extent. Thus, the central idea of the present investigation was to allow these migrants to speak for themselves; to allow them to "explain" their migratory behavior and to allow any micro or macro explanations to emerge from their own explanations of their own behavior.

Central to the question of loss of talent by emigration is the definition of British "talent" itself. "Talent" cannot be equated with I.Q. level, any particular personality trait or any specific academic or educational experience other than the possession of a British "primary" degree of "good" quality. There is a possible difficulty involved in distinguishing between the concepts of "manpower" and "talent" since,

in terms of their potentialities, the migration of some British professionals would appear to be a "manpower" loss rather than a loss of "talent". What is suggested is that among the British pool of trained graduate-manpower, there is a core, whose number is unknown, of gifted, often creative, and unusually well-educated scientists; these are frequently the innovators of the society in which they work. Education is an important factor here, and many if not most of this group would have been educated beyond the baccalaureate level and sometimes beyond the doctoral level. It is not suggested that every holder of a "higher" degree in science possesses all these marks of the creative and talented innovator; it is not suggested that all Ph.D.s in science are "talented", as defined above, but the expectation that we should find our most creative and productive scientists, technologists, and academics among the holders of higher degrees and "good" first degrees will be fairly well accepted.

National resources of scientific talent then are indeed those knowledgeable and highly educated and trained professional workers - frequently possessing a higher degree - upon which modern industrial societies depend for scientific, industrial, technical, and academic services and for the innovations necessary to keep the society in balance with, and, happily, ahead of, other competing industrial societies. They are "national" resources of human talent because in Britain it is the nation which has subsidized their becoming professionals and it is the nation itself which ultimately looks to these persons for its professional needs. Consequently, any depletion of these national resources of scientific talent must be regarded with some concern as a potential threat to the socio-economic health of a nation.

Let us be perfectly clear on this point. The significance of this exploratory study is not that we know something more about a few hundred emigrants from Britain. The majority of these emigrants are active

scientists, physicists, chemists, mathematicians, engineers, technologists and university instructors. They were drawn from the corps of talent already at work in University, Government research laboratories, industrial establishments, and non-profit research institutions. These people are not in the scientific establishment - they constitute the scientific establishment. They are the basis for maintaining progress and extending it in those natural sciences upon which industry and technology literally feed, whether such scientists be the "pure" or "applied" variety. It is not a matter of science being "relevant" to industry; without science, industry and technology do not exist, possess a methodology, or have a basis for further development. Britain has a multitude of qualities, values, features, and traditions which render her beloved to her natives and to her friends, but they are not sufficient upon which to support life in an industrial era marked by survival through industrial exports. If Britain is not an industrial nation, she is nothing; without a livelihood, there can be no life in the qualitative sense.

The basis for modern industrial health, and thus a nation's economic position, rests upon science and science in technology. Economic health, its strength and thrust, contribute to and form the basis for the political state of the nation among other nations. Teleologically speaking, in this post-Sputnik world, what begins in the laboratory frequently provides the basis for the worth and viability of the agreement which is reached across the diplomatic conference table. To weaken a nation's scientific establishment; to render less attractive the conditions for science and scientists; to fail to meet the competitive going-rate for scientists in the world-market is to discount and handicap one's own industrial, economic and political position. Science, like art, has its own inherent worth and exists for its own sake and requires no ulterior purposes for its own justification. We do not suggest that a nation should advance in science

only for the purpose of advancing the nation. However, it would be the sheerest sort of folly to ignore the fact that one's scientific policies have far reaching impacts upon the whole state of the nation, even unto rates of migration for scientists and others. The obverse statement, namely that a nation's military and geopolitical position has something to do with its national expenditure on science is so obvious as to be almost a modern day truism.

The approach here is to attempt to seek a pattern in the present migratory flow of professionals from Britain to North America during the period of 1952-1964. This period was specifically chosen because it coincides generally with that of the Royal Society Report on the same subject. We were primarily interested in the physical sciences, particularly physicists and chemists as well as engineers, but academics and physicians also figure since these are the particular professionals about whom most anxiety is expressed in Britain due to their relevance to modern industrial life. Some macro patterns in migratory movement of scientists have already been identified by others in rather general terms. Dedijer (1964, page 966) suggests that, "The migration of scientists has certain preferred directions: from the less developed to the more developed countries, from countries developing slowly to countries developing rapidly, from small countries with developed science to large countries with developed science, and, most important, from countries with less-developed science and education policies to those with more-developed ones."

A few words about the relative size of the flow of scientific talent from Britain. In 1962, an ad hoc Committee of the Royal Society with Sir Gordon Sutherland as Chairman, began an effort among more than 500 departments of science of British universities to ascertain the amount of loss due to emigration of Ph.D. holders in those departments. Only Ph.D. holders were included - and only university records were used - both conditions being open to much criticism. The Royal Society concluded that the annual rate of permanent emigration of recent Ph.D.s is about 12 per cent of the total output in the field included in the survey; that about 140 depart each year with 60 entering the USA, 20 entering Canada, 35 to other Commonwealth countries, and 25 to all other countries. Further, they conclude that the flow of recent Ph.D.s has increased by a factor of about three in the decade of 1952-1962. The Report concludes that if temporary emigrants are included, the annual rate of migration to all countries of recent Ph.D.s is "now" (1962) 260, or over 22 per cent of the total annual output in the subjects investigated - one thousand to one thousand four hundred

such new graduates being at risk in any single year. The Report makes no allowance for entering British or American scientists and others; all statistics are gross losses and the "net" position remains in considerable doubt. The Report concludes that the emigration to the USA has doubled in the last ten years and is "still increasing". Cumulatively, the record reflects that of 8,537 known recipients of Ph.D. degrees in science, 1,136 emigrated permanently during the decade. A further 1,053 Ph.D. holders emigrated on a "mostly temporary" basis, of whom 545 have returned, 143 have not returned and the location of 365 was not known. The Royal Society concludes that the overall average loss during the decade was 16 per cent of the annual British Ph.D. production in the various fields of science and that approximately half emigrated to the USA. But the actual annual rate of emigration has fluctuated between the 8 per cent in 1952 to 19 per cent in 1957. The rate for non-Ph.D. holders in science is about 2 per cent per year to the USA of all degree holders in science.

Specifically, what are the dangers to Britain of the so-called "drain of brains" from its shores to the science establishments of other countries, especially those of North America?

1. Loss of the national financial resources which the education of such high-level scientific talent represents and the saving entailed by the USA and Canada in not having to underwrite such educational costs.
2. The loss to a competing socio-economy of productive scientists; in actual fact, a subsidy of a competing industrial power (all too clear, for example, in the U.S. air-frame industry).

3. Teachers as well as their students emigrate; the loss of the producers of science Ph.D.s tend to decelerate Ph.D. production in British science.
4. There is the loss of the actual products of the research of the lost scientists; and with these, the profits that could have been gained to the British economy. The worst has already happened - not once but many times: British institutions have had to pay licensing fees and such upon patented techniques produced by British scientists abroad.
5. The migration of scientists tend to continue the shift of the center of scientific excellence out of Britain; talent attracts talent, and to make North America more attractive only accentuates the problem.
6. Aside from the more routine findings, functions, and contributions of immigrant British scientists, there is always the possibility of the major breakthrough, i.e., how much is the equivalent of an Einstein "worth"? a Fermi? Should such an emigrant scientist make such a breakthrough, the benefit will be America's and not Britain's, in any economic sense.

What causes such a migratory trend - if indeed it is a trend?

The following points have been put by responsible persons in explanation of such migration.

1. Inadequate salaries for scientific researchers in British universities, government, and industry establishments.
2. Inadequate equipment, laboratories, and general facilities in these science establishments.

3. Inadequate post-graduate facilities in British universities; primarily posts, stipends, and opportunities for research. Many buildings allegedly are old and cramped.
4. That inadequate time for research is provided to university research personnel.
5. That Britain currently "overproduces" or "underabsorbs" talent; that fewer posts - especially at middle or senior levels - exist than talent available to fill such posts.
6. That scientific research as such is not respected; that scientists are not welcomed into general industrial management; that the rewards in Britain go to the liberal-arts trained Oxbridge and Eton types.
7. Even if adequate funds can be gained for basic research in the sciences, there are inadequate funds to maintain equipment, make modifications to buildings, provide funds for payment of ancillary personnel, etc.
8. That the balance of power in science has now shifted, the two polarities now being Russia and the USA; that the latter is to Britain what Germany used to be to Britain and to the USA during the twenties and thirties - the scientific center of the world.
9. The low state of morale in Britain and British science has been cited as well as the major change in Britain from a major Empire to a "small offshore island" on the European coast. The feeling is that British science and perhaps Britain herself are becoming increasingly "irrelevant" to the world situation in matters scientific, political and economic

It has been alleged that the current level of migration is a "wastage"; but it appears that migration cannot be equated to scientific "wastage" as such. The talent of these emigrating scientists and other professionals is not being "wasted" in North America although it may be lost to Britain. But scientific talent can be "wasted" if it remains in Britain in a condition of being unsupported, unstimulated and frustrated in what it intends.

The problem of "cause" remains; but merely noting the "push" and "pull" factors seems inadequate to explain the migration of specific British scientists; any explanation would appear to have to be catholic enough to explain the migration of some and the non-migration of others similarly qualified. Britain is "full" of scientists and other professionals who have turned down lucrative and exciting offers from North America and elsewhere that seem to attract others. In a word, why is migration evoked as a response in some and not in others?

The answer would appear to be not in the environment because the environmental factors seem to evoke migration and non-migration; the cause appears to be in the "motivational" and values patterns of the individual themselves. What is the meaning of the migration of such scientists and professionals? To what are they, in truth, responding? What is it they seek? What values do they hold which render emigration an understandable response? Some answers to this riddle emerge from the research at hand.

The Investigation

The Sample

Made up of two "one-hundred per cent groups"; in 1962, all North American members of the British Institute of Physics and the Physical Society and the Royal Institute of Chemistry; 556 and 306 members, respectively; 345 others drawn from a variety of sources; Total, 1,207.

The Questionnaire

(A copy appears in the appendix)

The question on page two concerning "personalities factors" is wholly a suggestive question; we are suggesting the possibility now (rather than probing obviously for an answer later) in order to prepare the respondents for answering the open-ended portions of the questionnaire which follows. Many of the items on the last two pages, such as those concerning American television and advertising, are mere "fillers" proving opportunities for the migrants to be negative concerning the American culture; this technique was used to reduce any potential dissonance between their feelings and their answers in the check list as they emerged. We also wanted to avoid the production of any chauvinist-oriented guilt-feelings which might tend to bias later responses, i.e., we did not want the respondent to have to "look for opportunities" to be negative. (We knew that migrants were highly critical of American television, journalism, advertising, etc., based upon our earlier correspondence with them). We were primarily interested in the work-situation, opportunities for research, advancement, and other professional factors. Nine items from the "check list" had to be deleted due to their being ambiguously received by the respondents.

Selected Findings of the Recent Investigation

Almost 90 per cent of the estimated maximum percentage of questionnaire return for the gross sample was achieved. In effect, almost 800 questionnaires of the estimated maximum of 925 were returned. Over 50 per cent of the questionnaires returned were from physicists and chemists and it was this group of 517 "hard" scientists, including some engineers and other miscellaneous scientists such as astronomers and mathematicians, which received the most detailed analysis. Unless otherwise stated, materials reported and discussed here concern this group of 517 "hard" scientists.

Before the values and motivation patterns of the migrating British scientists can be discussed, it is necessary to focus on "which" scientists, in actual fact, selected themselves for migration. If it is true that "we are what we value," and that which we value moves us to action, these are aspects of the same question. But, the migrating scientists studied have sociological and professional marks of identity as well as value and motivation constellations, and because these two factors are doubtless related, a few of the more pertinent marks of sociological and professional identity are provided here. Not all British scientists emigrate and not all British scientists evidence the marks of identity found in our sample.

One of the first factors which emerged from the study is the fact that London, Oxford and Cambridge Universities contributed over 50 per cent of the total sample of migrating scientists. Although this factor, in part, reflects the larger productivity of science Ph.D.s in these institutions in relation to the other institutions of higher learning in Britain, these institutions appear to be over-represented in relation to their contribution of science Ph.D.s to the science establishment of

Britain. London University, in particular, with over 35 per cent of the migrating scientists receiving terminal degrees from that institution is especially over-represented. In addition, it is interesting to note that 32.8 of the migrant scientists report the London area as a last address before migration and another 18.8 per cent report either Oxford or Cambridge. London and "Oxbridge" are obviously major staging areas for migrating scientists and all three have major science establishments known for the sustained excellence of their scientific work.

It is in the area of academic quality that one of the most obvious and striking relationships occurs: although, generally speaking, only 10 per cent (approximately) of the British graduates achieve a First Class Honours degree, 174 of our hard science sample of 517 had done so. Two hundred and twenty seven of the remaining scientists were awarded a Second Class Honours Degree and only 12 obtained a Third Class Honours degree. It is important to note that one need not have a degree of any sort to gain membership in either of the scientific societies from which the majority of the sample was drawn. But, interestingly enough, only 155 persons in our sample of 517 had not gained a higher degree of some sort; in fact, 30 obtained a M.Sc. in the United Kingdom before emigrating, 325 had obtained a Ph.D. or D. Phil. degree (12 more since emigrating) and all migrants held D. Sc.'s. There were nine Fellows of the Royal Society in the sample.

This is a "young" group of productive scientists (only 23 of the several hundred physicists and chemists report themselves as not being engaged in active research) in the prime of their productive careers; they range in age from 24 to 73 years of age, but 33.3 per cent are 30 years of age or younger, 29.1 are between 31 and 45 years of age and 17.7 are between 36 and 40.

Thirteen per cent of the scientists are in government work, 39.3 per cent are in industry and 39.8 are in university work, while 7.9 per cent of the remainder are in "other" types of institutions such as non-profit research foundations.

Although this is a comparatively youthful group of scientists well-seeded with students and post-doctoral Fellows earning mere or near-subsistence amounts, the median salary of the British scientists in North America was, in mid-summer, 1964, more than \$10,000 and less than \$12,500. The median salary for those employed in university work is over \$8,000 and under \$10,000, while the median salary for those employed in industry is over \$12,500 and under \$15,000 per year. There are 72 men in the entire hard science sample earning more than \$18,500 per year, including several academics (of the 20 in university work above this salary level) earning approximately \$40,000 per year. The majority of these high-salary researchers and administrators emigrated after 1955 and 18 arrived between 1961 and January, 1964, which appears to indicate that a number of British migrant scientists take up posts of higher responsibility immediately upon or soon after their arrival in North America. Only one of this group of high-salary people intends to return to the U.K. and 32 have already become Canadian or American citizens.

There are several other significant and related factors reflected in the findings: in the "hard science" sample, 77.1 per cent had themselves initiated negotiations with their first North American employer, 22.9 had been contacted by the first North American employer; 95.7 "do not regret" their decision to emigrate, 1.0 per cent "regret" their decision, and 3.3 are "uncertain;" 72.1 per cent are "definitely permanent" or "will probably remain" in North America while 27.9 per cent will "definitely" or "probably" return to the United Kingdom.

Over 89 per cent of the migrants have "fulfilled" their professional expectations in North America and another five per cent or so are "in process of doing so"; over 55 per cent "would tend to encourage" a colleague to emigrate to North America (40.1 "would take no position") and 39.1 per cent of the respondents felt that the flow of British scientific talent to North America would "increase", and 50.6 indicate that, in their opinion, it "will remain the same." Only 10.3 per cent indicate that they think the flow will "diminish."

Central to the issue at hand are the results of the questionnaire "check list" concerning work and conditions for scientific work, the results of which are reported here:

(G = gain L = loss LD = little difference NAM = not apply to me)

Items	"Temporary" Migrants				"Permanent" Migrants			
	G	L	ID	NAM	G	L	ID	NAM
Working conditions	76.7	6.0	14.7	2.6	75.6	4.9	17.1	2.4
Freedom to research	46.4	3.6	46.4	3.6	48.8	4.9	39.0	7.3
Quality of research equipment	66.7	3.7	22.2	7.4	67.6	2.5	22.5	7.4
Time for research	32.1	10.7	53.5	3.7	35.9	10.2	38.4	15.5
Annual income	89.3	0.0	10.7	0.0	97.5	0.0	2.5	0.0
Intellectual stimulation	42.3	22.9	34.8	0.0	52.4	17.3	30.3	0.0
Amount of available research equipment	67.9	7.1	14.3	10.7	76.2	7.1	9.6	7.1
"room at the top" for advancement	65.4	0.0	15.4	19.2	82.5	2.5	12.5	2.5
Ancillary services for research	64.3	10.7	21.4	3.6	62.7	12.2	17.6	7.5
Standard of living	75.0	0.0	25.0	0.0	95.1	0.0	4.9	0.0
Administrative freedom on job	40.8	11.1	25.9	22.2	47.2	5.0	42.5	5.3
Opportunity to advance professionally	71.4	7.4	16.5	3.7	85.1	2.4	10.0	2.5
Flexibility in work organization	50.0	6.3	43.7	0.0	63.9	2.8	30.5	2.8
Financial reward for skill increase	53.8	3.8	19.0	23.4	80.1	2.2	15.0	2.7
Opportunity to specialize	40.0	3.8	40.0	16.2	35.1	2.6	44.1	18.2
Amount of communication with superiors	53.8	7.7	38.5	0.0	80.1	5.0	12.4	2.5
Spirit of urgency in my work	35.7	10.7	50.0	3.6	50.2	5.0	44.8	0.0
Scientific exploitation of my work	45.5	9.1	31.8	13.6	47.2	2.8	33.3	16.7
Rapidity of promotion in my work	42.3	0.0	34.6	23.1	64.8	0.0	27.1	8.1

Averaging the percentages on these work items for the total sample, the percentage "gain" is 62.7 per cent; percentage "loss" is 4.3 per cent; "little difference" 29.7 and "does not apply to me" 3.3 per cent. One of the interesting factors to emerge is that in spite of improved quality of research equipment, generally financial rewards, and increased amounts of available equipment, 59.2 per cent of the "temporary" emigrants and 48.6 per cent of the "permanent" emigrants indicate that there is little difference in the quality of their work. Approximately 40 per cent report a "gain," but for many emigrants, the "gain" in North America is apparently personal rather than professional.

It is obvious that the open-ended questions numbered one to six (excluding five) had to do with values, attitudes, and motivation; further, that they overlap. This overlapping was intentional in order to ascertain if similar themes and percentages as to themes would emerge in each; the pattern which emerged was strikingly similar as to subject and theme with the only real, although not significant, variation being between questions two and three (Wilson, 1964, pp. 395-397).

Question 2. "When asked, I explain my emigration to North America by saying":

(The following types of reply are not mutually exclusive).

The type of reply "Low status for scientists" and "science in United Kingdom is demoralised" was mentioned by 14.1 per cent.

"Britain frustrating and depressing" 12.5 per cent, and if this reward was extended, the source of frustration mentioned tended to be the British social class system.

"Lack of facilities in the United Kingdom": 10.4 per cent.

"Low United Kingdom salaries": 6.2 per cent.

"Britain is overcrowded": 5.3 per cent.

"To get out of taxes, conscription and/or defense research": 2.3 per cent.

"Depressing British climate": 2.1 per cent.

(The above types of reply can be classified as "Push" factors).

The reply, "Greater professional opportunities in North America" (opportunity to use their talents?): 38.6 per cent.

"Higher salary in North America": 18.0 per cent.

"Higher standard of living": 10.6 per cent.

"Higher social standing": 6.5 per cent.

"For the benefit of my children": 3.9 per cent.

"Retire here at a later age": 1.2 per cent.

(The above six types of reply can be classified as "Pull" factors).

A reply indicative of "wanderlust" was mentioned by 12.7 per cent of the 517 "hard scientists."

"To widen my scientific experience" by 12.7 per cent.

"I was Invited" or "the offer came from there" by 7.9 per cent.

"Specific interest to visit North America" by 6 per cent.

"Come for -- years experience" by 4.6 per cent, and 2.8 per cent went either because wife was American or wanted to "Visit" America.

(These last six types of reply were regarded as "neutral" factors: i.e., the person was neither strongly pushed out of the United Kingdom nor strongly pulled into North America).

Dividing the responses into "Push," "Pull," "Neutral" or any combination of these, it was found that 17.5 per cent mentioned only being pushed out of the United Kingdom, and only 11 of these 76 (actual number) intend returning to the United Kingdom. 27.8 per cent mentioned only being attracted (pulled) to North America and only 22 of these 121 (actual number) intent to return to the United Kingdom, 28.0 per cent mentioned only what have been called "neutral" reasons but, what is more surprising is that 70 of these 122 (who went out of "curiosity" etc.) intent to remain in North America. 10.1 per cent mentioned both "push and pull" reasons; 5.5 per cent mentioned "push and neutral" reasons; 9.9 per cent mentioned "pull and neutral" reasons, and the remaining 1.2 per cent gave all three types of reply.

Question 3. "I do not normally speak of the following reasons for emigration":

351 of the 517 "hard scientists" had no "hidden" (their interpretation of this question) or inarticulated reasons for emigrating. Of those that had, their replies tended to fall into the following non-mutually exclusive categories:

"Irritation with British --" mentioned by 36.7 per cent; in the majority of cases, the causes of irritation were conditions in the British Universities, Scientific Civil Service or in British industrial and commercial employment.

"Irritation with the British class system": 20.3 per cent.

"Snob values among British intellectuals": 19.0 per cent.

"High taxation": 8.9 per cent.

"Financially better off in North America" of just "MONEY": 20.9 per cent.

"Better recreational and social facilities in North America": 8.9 per cent.

"Better climate in North America": 6.3 per cent.

"Wanderlust": 7.0 per cent.

"Boundless possibilities in North America": 5.7 per cent.

5.7 per cent have "hidden" "personal reasons," and 3.2 per cent "Wish to make a complete change."

Of the 166 have some "hidden" reasons for emigrating, 125 intend to remain in North America, and only 41 intend to return to the United Kingdom. It would seem, therefore, that a "hidden" or inarticulated reason for emigrating increases the likelihood of the emigration being permanent. It appeared that the inarticulated reasons were closer to the motivational materials imbedded in the comments volunteered by the migrants. Dividing all the responses into those dealing with work, professional and socioeconomic aspects, "neutral" reasons such as

"Wanderlust," or any combination of these three it was found that 32.3 per cent of the respondents made comments concerning work or working conditions. Only 11.9 gave only replies of the professional or socio-economic type, while 32.1 per cent gave only neutral reasons and, surprisingly enough, only 25 of the 140 (actual number) in this neutral category intend to return to the United Kingdom. In addition, 15.4 per cent on the comments pertained to both socioeconomic and work conditions; 41.6 per cent mentioned both work and neutral reasons, and the remaining 0.9 per cent mentioned all three types of response-themes.

It is obvious that some of the migrants are pulled into North America by higher salaries, a higher standard of living, more funds for research, and more and better equipment for research. They come for more freedom to follow their own research aspirations and for more time for the pursuit thereof. But, just as obviously, it is a minority of migrants who invoke such factors in explanation of their own case. And, when they do suggest such motivation, they frequently indicate that these factors are themselves not ends but mere means to other more important ends, such as increasing the quality of their work, more opportunities to exploit -- in the scientific sense -- their findings, or to add to their experience and skills or often simply to find greater meaning and challenge in their scientific work. Just as surely, some of the migrants come because they have been thwarted and frustrated in their work or because they are irritated with things in Britain -- often the class-system, or the autocratic one-professor University departments; there are the kind of factors they cite as pushing them from Britain. However, this factor alone would effectively explain little more than a third of the sample (if that, because

such individuals cite other factors as well) in respect of social situation or individual motivation. When serious thwarting does appear, it appears very definitely and usually with great strength. A few of the migrants seem to be natural nomads and they indicate the next one or two countries in which they hope to live and work following their stay in North America. Some few others indicate that long service in the armed forces or in colonial service "dislodged" and alienated them from life in Britain -- broke their sometimes already tenuous ties with the British culture and prepared them for residence elsewhere. A very few, similar to Martin Green (1960) appear to be saying that they never did feel at home in Britain, never really penetrated and became one with the culture. Some few migrant scientists cite specifically personal reasons for emigration, having little to do with their profession; for example, the following cases:

My father being a knight and a rather well-known person in English academic life, I wanted to make my career without his help.

I wished to undertake research on the history and theology of Mormonism and this was possible only in Utah. (From a scientist).

Values and Motivation: British Migrant Scientists

But, it is the factor of "personality" at work among the migrant group, that which Richardson (1959, p. 329) calls "his general behavioral tendencies" which clearly emerge as the most dynamic of the factors or influences operating toward emigration in this migrant sample. It is the dynamism of "personality factors," a mix of values, behavior, attitudes and traits, that emerges so forcefully as one of the two major demonstrations of this investigation. The other demonstration being: that environmental factors, including salary factors, acting alone, are inadequate to explain either the contemporary migration of British scientist or the

non-migration of similarly trained (and we assume, similarly competent) professional colleagues. However, personality, motivational and value pattern factors are sufficiently catholic to embrace the remaining in Britain of many scientists and the departure of others. It is emphatically suggested by the recent investigation that any future empirical inquiries into migration of scientists from Britain should concentrate their efforts in this direction. An obvious 'second-level attack upon this problem appears to be the necessity for a comparative study with migrant scientists and matched non-migrant controls, similar to the studies of Richardson (1956, 1959) among British manual-workers destined for Australia.

What does emerge from the recent investigation is a very generalized migrant-typology that appears to be unmistakable. Central to the issue at hand is the question of quality; it is clearly not the academic failures in science who tend to emigrate. The high percentage of First Class Honours degrees, and those holding doctorates (coupled with a low percentage of Third Class, "General," "Pass" or no degree) appears to be indicative of a high-quality scientific group. Secondly, the large number of migrants who received their degrees from the older and most prestigious universities of Britain is another factor in support of the quality argument. Further, the comparatively large number of "high" salaries, in excess of \$18,500, the number of migrants holding posts (often in their "thirties") of responsibility, including department headships in North America universities and being paid up to \$40,000 for their contribution, is another indication of quality. Financially speaking, the British scientists are certainly doing at least as well as similarly educated North American colleagues and it would appear that they may be doing better as a group. It is obvious that this is a comparatively young group of fairly recent arrivals in the prime

of their productive careers; the median age group is 31 to 35 and 54.7 per cent of the "hard science" sample emigrated between 1961 and January, 1964. Within this group, 146 or 52.5 per cent emigrated in 1963, which would suggest some sort of possible acceleration in emigration of scientists from Britain. In addition, it is fairly well known that responsible seekers and interviewers of British talent in America such as I.C.I. can hire up to 70 per cent of the British scientists they interview in North America and only 50 per cent of those interviewed in Britain meet their standards (Hughes, 1964). (Doubtless some of this higher rate of hiring is specifically due to the additive American experience as such). However, the fact that the British government in the person of the Scientific Civil Service Joint Board and several of the large British industrial corporations find it advisable to carry on extensive recruiting activities among resident British scientists in America speaks well of the quality of these migrants and says something about the number of resident in North America.

These are not only young, very well educated, successful scientists, they also seem to have some of the personality factors such as high-energy, ambition, and "drive" which have come to be associated (if only in the cultural sense) with creative excellence and scientific productivity. There is a discernible migrant "type" in the sample, which stands revealed in the comments, the descriptions of self and situation, and the explanation of their emigration which the migrant scientists provided via the questionnaire. The findings of the recent investigation agree closely with the findings of Richardson (1959, p. 332) who, in testing "intending" British migrants of skilled manual occupation (and non-migrant controls) found that the ". . . emigrants appear to be more ambitious, more motivated, more interested in action and hard

work, than the non-migrants (*italics ours*). The migrants appear to want more opportunity for more hard work, more challenge, more advancement, more encouragement to innovate, more dynamic science. The migrant sample appears to have more than its share of people with "high-boiling points."

As might be expected, their frustration-tolerance level seems to be low in the case of some. It appears not to be that they are merely impulsive when confronted with frustration, but rather, that they refuse to be blocked for long and quickly find their ways around that which is frustrating. The following comment by Jackson, (1964, p. 54), a migrant-engineer at M.I.T. illustrates this issue:

. . . I went back to the College of Science and Technology at Manchester, and I sort of expected there might be some interest in what Brown & Company had been up to at M.I.T. . . . but the reaction was: "Well, you're back. How about a game of table tennis"? I thought there might be some hope for students, and I was teaching a course in circuit theory. Now, Professor Guillemin, who was active then at M.I.T., had a very elegant and general way of looking at this subject, and I thought I'd introduce some of this into the course. It was the only time in my career I've had any objection to my teaching. From the students! It wasn't in the syllabus; how could they prepare for the exams? I gave up. That very day I wrote to Gordon Brown.

The migrant group can be characterized by invoking such adjectives as "active," "energetic," and especially, "ambitious," but even "ambitious" is not strong enough or specific enough to characterize the aura cast by the group. Certainly, the British migrants are not "ambitious" in the more materialistic sense of merely wanting bigger salaries and a higher standard of living; these things emerge as

desirable but rather as by-products of achieving other more meaningful goals and not as the major goals themselves. It apparently is achieving, as such, which interests this group. The migrant sample appears to be "ambitious" in the sense of demonstrating a high level of aspiration, a high need-for-achievement; they are ambitious (hungry) for experience of all kinds -- and, at the core of things, they seem to want an opportunity to use their rather extensive talents. This last item is a central theme in the commentaries of these professional workers; like most professionals they seem to express themselves as persons most vitally in their work, and it appears that in the deepest sense, they are vested in their work and want to be allowed to get on with it. This is not unlike the findings of other researchers such as Eiduson (1962, pp. 302-205). Migration is seen as a means toward this end -- using their rather extensive professional talents to the best advantage and not as an end in itself.

Not much guilt or chauvinism is apparent in our sample. Emigration tends not to be seen as a moral issue; emigration is not perceived as a political act and patriotism figures only to the extent that a number of scientists allude to the fact that their professional education was provided by the State. There is very little "rejection of Britain" in the response of the migrant-scientists. The migrant sample seems thoroughly "British" in the cultural sense and there is much love of "home" and much nostalgia concerning things British in their replies, which, oddly enough, were sometimes couched in very American-sounding terminology. The migrants keep in touch with "home," they make frequent visits back, they read British non-professional publications regularly, they miss their "Blue Bass," the "good theatre," and the "B.B.C."

Every country and every period in a country's history produces its own expatriates, but what appears to emerge from the recent study is that economic, social, political, and certainly conditions for science in Britain seem to be setting into migratory motion an unusually large number of scientists, technologists, physicians, and other professionals. The more vulnerable personality types in these groups can only be discerned at this point in rather broad dimensions. This potentially migratory group at risk appears to be made up of people for whom Britain, as such, seems to have little "holding power"; at the very least, it can be said that, for this group, there are more important goals than living in Britain as such and the migratory group evidently feels that the specific goals, their scientific values, if you will, that move them can best be achieved outside Britain. This seems to be a group of men who "work hard and play hard" and they are not put off by what they indicate as the "faster pace" of North America; if anything, they appear to prefer this pace to others. One emigrant commented that he found the social system of North America "less congenial but more stimulating." Another migrant scientist indicates that he came to the USA because here he can voluntarily come into his lab to work at seven o'clock in the morning, while in Britain he would be criticized or misunderstood for doing so. As a group, the emigrants appear to prefer stimulation to congeniality, change to stability, and challenge to relative tranquility. The image of North American culture appearing in their comments is one of lusty competition at professional and economic levels; the rewards go to those who work hard, produce, are not shy about broadcasting their successes and who meet any situation "aggressively" as an individual. The group appears to be admirably equipped to do just that. The desire to maintain and express their individuality in a competitive situation is a theme which runs through

much of the emigrant comment. Yet, they seem to value the more egalitarian class-structure of North America to the class-structure which obtained in Britain.

As a whole, the migrant sample seems to be one which might have more than its share of creative innovators apart from the bias in respect of professional quality which seems to exist; this is suggested not only by the verve and affective intensity which appears in many of the questionnaire responses but more obviously and more universally by the lively humour present. Although many of the emigrants are wry, satirical, often sarcastic, playful, and facetious in reply, humour is almost always used in order to communicate more effectively. It is humour with a "bite" and it is visited indiscriminately upon things British, American, self and others, friend and foe, alike. The relationship between creativity and such good and insightful use of humour remains poorly defined but there are some hints that these two factors are closely related (Getzels and Jackson, 1962, pp. 89, 102-105).

Scientists have always been nomadic and the best of them tend to be the most nomadic of all because the better they are, the more they are known and sought after; thus, the greater their mobility. The British migrant scientists -- these intellectual free-men of the world -- want to go where their needs and aspirations, their desire to give of their best -- can best be met. The era of non-critical acceptance of an economic system, a society, a scientific establishment has ended for many. Now, allegiance must be earned and especially is this true in the case of those gifted and well-educated persons of scientific talent who are now potentially the most mobile of men, and paradoxically, those who are also in a position to make the largest contribution to their country and society of origin. The contemporary British migrant scientist appears to be leaving Britain because his needs and aspirations -- in the

largest possible sense -- are not being met, and this goes far beyond mere salary levels. Britain seems to be "right" about many of the small items to which the emigrants are attached, but North America is "right" about many of the "big" items that move them, such as offering greater opportunities for professional development and self-expression in their work. Even the extending-of-the-self professionally is not enough for some in the sample: several give the impression of wanting to test themselves against the experience of emigration and of working and living in another culture. Some say they wanted to see "how they stood in relation to North America science and scientists"; emigration appears to be a kind of crucible for the testing of their own mettle in what they felt to be the strongest running stream. Others seem to be responding to the opportunity to exercise personal power in the benign sense; to reach the top of a research laboratory or to head a university department -- to form something new and uniquely theirs with their own hands and minds and to see it take form before their eyes. For this group, opportunities to do so are more crucial than living in Britain.

Conclusion

Because of its size, direction, excellence and vitality, the science establishment of the U.S.A. is now being compared with pre-1939 era of German science; responsible British senior scientists such as Professor J. W. Mitchell, (1965) ex-head of the National Chemical Laboratory in Britain and now of the Department of Physics, University of Virginia, have made strong public statements concerning the leadership of American science.

There can be no doubt as to the present strength of science and technology in the United States of America Research has been one of the important growth industries of the United States during the past 20 years and there is no question of the fact that the strength of American science and technology is founded directly upon the strength of the American scientific community, which is formed by a relatively large number of research groups of super-critical size (Mitchell, 1965, p. 923).

Science, technology, and research are not only critical values of themselves within the American culture but are having increased operational impact on many facets of life as we know them today. It is the strength and excellence of this American science establishment to which the British migrant scientists are responding. They are responding in numbers heretofore unknown. That their expectations are fulfilled -- that their scientific and professional needs are met -- would seem to indicate that the values patterns they bring with them are shared and reinforced by the American science institutions to which they go. Here, science as means and science as end (these have never been adequately distinguished in the U.S.A.) have altered the direction, rate, and quantity of scientific emigration from Britain. That which such scientists value is more easily achieved here; there can be no greater compliment to American science and to the values of American scientists,

coming as it does from men and women who love their homeland and look back more in sorrow than in anger.

If solutions and remedies are to be sought for the apparently one-way and evidently accelerating flow of British talent to North America, in what direction might one begin to search? In the considered judgment of the writer, little can be done to regain the emigrated talent already lost (and it is considerable). But much can be done to ensure that Britain will lose a decreasing amount of talent in the future but this will depend upon the scientific policies she adopts, the funds she spends and the environment and atmosphere for science she creates. Everything that can be done should be done, by way of finance and organization, to strengthen the conditions for science and for individual scientific enterprise in Britain, in order to decrease the number of scientific professionals who now feel pushed from Britain and who seem to depart reluctantly and without much enthusiasm. However, fewer of this type were found in the sample than was expected; the amount of hypothetical improvement to be gained from this generalized remedy is not as large as would have been expected previous to the research in hand.

Britain is far from being an impoverished nation; she continues to be one of the wealthier industrial nations in the world (albeit one with perhaps over-much pre-industrial nostalgia). But Britain's educational and scientific programmes have not always reflected her general wealth; let them reflect it now.

Even if current emigration rates cannot be significantly decreased, a great deal can be done to attract talented North American and others in replacement of emigration losses. In a word, let Britain begin

"fighting back" as one emigrant in the sample suggested. Britain might become as willing to offer positions of responsibility to North Americans as North American appears to be to appoint British professionals.

Surely it is accepted by all that literally no one, and certainly not North America, could benefit by a weakened Britain in the scientific and industrial sense. This is all too clearly seen in the economic area due to the extent to which our economies are more, or less, happily entwined. This implies what conscious Americans also see: that the arrival of an American scientific monolith, draining off the best of the talent which Europe produces is not acceptable. The short-range benefits tend to disappear in view of the long-range economic, political, and human problems which would result. It would not even be good for American science as such; the existence of parallel, alternative, and competing scientific establishments with their own traditions of excellence and methods, work to the advantage of all science everywhere.

It is true that one day it may not matter in any economic or political sense on which side of the Atlantic talented professionals decide to develop and use their talents but this cannot and will not come about unless the choice is made more difficult than it is at present for people of talent, especially in Britain. Specifically, Britain's contemporary job seems to be one of making the decision concerning the locus of scientific education and practice for high-level professional talent considerably more difficult than this decision evidently is at present, by righting the scientific imbalance to the extent which may be possible. Only Britain can decide the limits of that possibility.

"I am an individual ... I give my allegiance as a free man to those agencies most likely to meet my criteria for a meaningful existence".- AN ANONYMOUS BRITISH IMMIGRANT TO AMERICA, 1964.

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APPENDIX

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A QUESTIONNAIRE FOR BRITISH PROFESSIONALS RESIDENT IN NORTH AMERICA

My profession, or occupation is _____ Date _____

My research field, (if relevant) is _____

Age _____ I am male _____ female _____ My father's occupation is/was _____

I am: married _____ single _____ divorced _____ separated _____ widowed _____

My wife (husband) is British _____ Canadian _____ American _____ Other (specify) _____

I have (No.) _____ children. Their ages are _____

My place of birth was _____

I now live in (City and State/Province) _____

My last address in the UK was (town/county) _____

The approximate date of my last entry to North America was _____

This is my (No.) _____ visit or period of residence in North America.

I hold the following type of Visa or Entry Permit: Exchange _____
Immigrant _____ Visitor _____ Refugee _____ (Other) _____

I am a national of the UK _____ USA _____ Canada _____ (Other) _____

I attended a "Public" _____ Grammar (State or private) _____ Technical _____
Secondary Modern _____ Other (specify) _____

I did _____ did not _____ attend a boarding school.

I was awarded the _____ degree(s) from _____ University(s)
in (date) _____. The degree "class" of my first degree was _____

I was awarded the following professional qualifications _____

I am a member of the following British Learned or Professional Societies:

My last professional position and title in the UK was _____

I have changed jobs _____ times since emigrating to North America.

My present position and title is _____, in a
governmental _____ industrial _____ university _____ (other) _____ entity.

My present position is a temporary _____ permanent _____ appointment.

Negotiations for my first position in North America were initiated by me _____ my
employer _____. Negotiations were carried on via telephone _____ written
correspondence _____ interviews _____ (other) _____

I received approximately £ _____ gross per annum from my last UK job.

My present gross salary per annum is:

_____ subsistence only during full-time	_____ over 12,500 and under 15,000 dollars
_____ study or research	_____ over 15,000 and under 18,500 dollars
_____ over 5000 and under 8000 dollars	_____ over 18,500 and under 25,000 dollars
_____ over 8000 and under 10,000 dollars	_____ over 25,000 and under 40,000 dollars
_____ over 10,000 and under 12,500 dollars	_____ over 40,000 dollars

My children are in American _____ Canadian _____ UK _____ (other) _____ schools.

I first really got the idea of emigrating from _____ when I was about _____ years of age.

I considered migrating for a period of _____ before finally deciding.

I have _____ have not _____ been contacted by British government, industrial, or research entities with a view to accepting a position in the UK.
Specify: _____

I subscribe to or regularly see the following British non-professional publications:

I have _____ have not _____ purchased a house or flat in North America.

I intend _____ do not intend _____ to alter my present national status.

Hypothetically speaking, my income per annum would probably be £ _____ had I remained in the UK.

I consider myself to be better trained _____ less well trained _____ equivalently trained _____ in comparison with North American colleagues.

I am satisfied _____ unsatisfied _____ uncertain _____ concerning the quality of North American schooling for my children.

I would _____ would not _____ prefer a British education for my children.

I would _____ would not _____ (uncertain) _____ welcome job offers from the UK.

Should a UK colleague broach the subject of emigrating to North America, I would _____ would not _____ tend to encourage him. (Or, would take no position _____.)

Holding economic and professional motivations constant I do _____ do not _____ think that "personality factors" figured in my decision to emigrate.

I continue to stay abroad for reasons different from those that brought me here:
Agree _____ disagree _____ uncertain _____

I have _____ have not _____ fulfilled my professional expectations in North America.

My social and emotional ties are now strongest in the UK _____ North America _____

I see myself as: definitely permanent _____ probably permanent _____ probably temporary _____ definitely temporary _____ in North America.

I have _____ have not _____ experienced what might be termed a "degree of guilt" about leaving the UK. (Answer only if you are a "permanent" emigrant)

I regret _____ do not regret _____ (uncertain) _____ my decision to emigrate.

In my area, the dollar equivalent to the £ in "real" goods and services is approximately _____ (for example, 3.50 to the £.)

I feel the flow of talent from Britain to North America will diminish _____ increase _____ remain about the same _____ during the next few years.

If I voted in the next British General Election, I would vote Labour _____ Conservative _____ Liberal _____ other _____

I would give the following advice to a British colleague about to embark for North America:

When asked, I explain my emigration to North America by saying, "

I do not normally speak of the following reasons for emigrating:

What influenced me most heavily toward migrating was

What my parents thought about my emigrating amounted to this:

I chose North America primarily because

Indicate whether, on balance, you have gained or lost, etc., as a result of emigrating:

	GAIN	LOSS	LITTLE DIFFERENCE	NOT APPLY TO ME
working conditions	_____	_____	_____	_____
quality of food	_____	_____	_____	_____
cultural opportunities	_____	_____	_____	_____
awareness of political corruption	_____	_____	_____	_____
conditions of climate	_____	_____	_____	_____
amount of leisure time	_____	_____	_____	_____
freedom to research	_____	_____	_____	_____
sense of political involvement	_____	_____	_____	_____
education for my children	_____	_____	_____	_____
awareness of being "British"	_____	_____	_____	_____
quality of research equipment	_____	_____	_____	_____
number of good friends	_____	_____	_____	_____
eas. of domestic chores	_____	_____	_____	_____
opportunity to be creative	_____	_____	_____	_____
quality of domestic journalism	_____	_____	_____	_____
feelings of self-respect	_____	_____	_____	_____

	GAIN	LOSS	LITTLE DIFFERENCE	NOT APPLY TO ME
awareness of crime and violence	_____	_____	_____	_____
time for research	_____	_____	_____	_____
satisfaction with my marriage	_____	_____	_____	_____
technical "know-how" in society	_____	_____	_____	_____
feelings of "rootlessness"	_____	_____	_____	_____
respect for North American education	_____	_____	_____	_____
awareness of advertising	_____	_____	_____	_____
annual income	_____	_____	_____	_____
intellectual stimulation	_____	_____	_____	_____
religious freedom	_____	_____	_____	_____
amount of available research equipment	_____	_____	_____	_____
quality of social services	_____	_____	_____	_____
"room at the top" for advancement	_____	_____	_____	_____
clean urban conditions	_____	_____	_____	_____
access to medical services	_____	_____	_____	_____
feelings of being part of an "elite"	_____	_____	_____	_____
ancillary services for research	_____	_____	_____	_____
standard of living	_____	_____	_____	_____
quality of television	_____	_____	_____	_____
probability of achieving personal goals	_____	_____	_____	_____
respect of society for research	_____	_____	_____	_____
tension on job	_____	_____	_____	_____
respect for British education	_____	_____	_____	_____
satisfaction with Great Britain	_____	_____	_____	_____
depth in friendship	_____	_____	_____	_____
amount of personal prestige or status	_____	_____	_____	_____
administrative freedom on job	_____	_____	_____	_____
feelings of "anti-Americanism"	_____	_____	_____	_____
sense of frustration	_____	_____	_____	_____
respect of society for science	_____	_____	_____	_____
opportunity to advance professionally	_____	_____	_____	_____
intellectual freedom	_____	_____	_____	_____
congenial social system	_____	_____	_____	_____

	<u>GAIN</u>	<u>LOSS</u>	<u>LITTLE DIFFERENCE</u>	<u>NOT APPLY TO ME</u>
flexibility in work organization	_____	_____	_____	_____
hopeful as to future	_____	_____	_____	_____
opportunity for my children	_____	_____	_____	_____
freedom of speech	_____	_____	_____	_____
financial reward for skill increase	_____	_____	_____	_____
economic security for retirement years	_____	_____	_____	_____
amount of "red-tape" at work	_____	_____	_____	_____
ability to save money in any form	_____	_____	_____	_____
opportunity to specialize	_____	_____	_____	_____
friendly relations between "classes"	_____	_____	_____	_____
anxiety about job	_____	_____	_____	_____
amount of communication with superiors	_____	_____	_____	_____
spirit of urgency in my work	_____	_____	_____	_____
my wife's happiness (or, husband's)	_____	_____	_____	_____
scientific exploitation of my work	_____	_____	_____	_____
rapidity of promotion in my work	_____	_____	_____	_____
quality of my work	_____	_____	_____	_____