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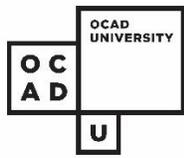
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Professionalization Theory, Medical Specialists and the Concept of “National Patterns of Specialization”

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Abstract: Studies comparing particular medical specialties in different national settings have not appeared in the sociology of the professions literature. Consequently, little is known about how local contexts actually affect the professionalization process and medical specialization. Are certain determinants of specialization active in some countries and not in others? Can some determinants be said to be *always* active? Two recent independent studies of medical geneticists in, respectively, the UK and Canada present a unique opportunity to reflect on earlier social-theoretical discussions concerning the determinants of medical specialization in the context of country-specific organizational frameworks. Placed side-by-side, the two studies lend support to earlier research that emphasize, first, conceptual and technological innovations in medicine as driving specialty formation, and, second, the dominant position of physicians in the resulting division of medical labour. Beyond this, however, each study throws highlight on local influences as being important with respect to particular courses of action or inaction at the national and regional level. In the end, what appear to be coherent sets of diagnostic and counselling services from a unitary, global perspective can also be viewed as loose networks of resource dependencies, personnel, and organizations which can be re-configured within local health care delivery systems.

Keywords: Specialism, professionalization theory, health care systems, medical genetics

Introduction

In probably the pioneering work on the subject, Marian Döhler argued forcibly for the need to study the impact of varying national contexts on specialty formation in medicine. Döhler (1993:186) contended that although country-specific paths of professionalization had been widely recognized in the literature on medical specialization, more work needed to be done with regard to the question of how local contexts influence the professionalization process. He described numerous case studies on the emergence of single medical specialties and threw highlight on certain key independent variables as influencing specialization. Yet, he said, the research failed to consider, first, different courses of development in specialty formation among professional segments in different countries and the emergence of distinct work patterns, and, second, diverging environmental contexts on independent variables. The consideration of local environmental contexts as an intervening variable, Döhler proposed, would lead to the realization that the basis of variance of the dependent variable (i.e., specialization) is culture-bound among local medical practitioners. Moreover, the number of indicators (e.g., formal training requirements, limitation of practice) is restricted and cannot be simply generalized across the spectrum of health care delivery systems in the world today.

With the acknowledgment that national patterns of medical specialization have not yet been fully examined and theorized, the aim of this article is to pick up where Döhler left off and contribute to the understanding of how, why, and to what effect local contexts affect particular courses of action or inaction with respect to specialization. Specifically, I seek to broaden and extend the view that a medical specialty represents a more or less coherent set of services from a more or less unitary perspective (i.e., professional medicine). What look like coherent sets of services at the multinational level may also be viewed as loose networks of resource dependencies, personnel, and organizations which can be re-configured within the context of local health care delivery systems. Consequently, I argue, we need to reflect on the specificity of local bias even as we become more proficient in identifying variables which serve as determinants of specialization.

The article begins by rephrasing the problem of medical specialization in professionalization theory in such a way as to avoid portraying the formation of medical specialties as simply global events. This leads to an analysis in which I draw on findings from, first, my own study of medical geneticists as formally approved medical specialists in Canada (Leeming, 1999), and, second, another study of medical geneticists in the UK (Coventry and Pickstone, 1999). As Döhler (1993:189) observed, there has been an absence of comparative studies on the topic of national patterns of specialization in medicine. Moreover, there have been only a few attempts so far in the sociology of the professions literature to undertake detailed case studies of medical specialists -- even at the single nation level. As such, the two studies of medical geneticists discussed in this article offer a unique opportunity to reflect on earlier social-theoretical discussions concerning the determinants of specialization in the context of country-specific organizational frameworks.

Theoretical Background

The earliest socio-theoretical discussions of the medical profession, from the 1930s to the 1950s, were not strictly focussed on the practice of medicine *per se*, but included medical practitioners among an elite group of occupations that were said to have become “professionalized” after the eighteenth century (Cockerham, 1988). Recalling Durkheim’s characterization of professional groupings, first, as products of the division of labour in modern society, and, second, as operating at a level between the individual and the state, some of the authors regarded professionalization as a positive force, resisting the excesses of both *laissez-faire* individualism and state collectivism (Tawney, 1982[1921]; Carr-Saunders and Wilson, 1933; Mannheim, 1935; Marshall, 1962[1939]; Parsons, 1965[1939]; Lewis and Maude, 1952). Others viewed the professions as monopolistic oligarchies, linked to the bureaucratization and increasing rationalization of modern society described by Weber (e.g., Mills, 1956; Young, 1958). The empirical field research that emerged from these discussions treated occupations as discrete entities, aggregated categories, or in terms of a hierarchical continuum (i.e., professions and non-professions).

Many early researchers sought to define some essential quality or qualities that distinguished the professions from other occupations. And as more and more studies set about investigating the impact of different professions on various spheres of social activity, two broad analytic approaches to the problem of occupations and professionalization materialized involving what Johnson (1972) labeled “trait” and “functionalist” models of the professions. Under these models, professionalization was portrayed as “a process with an end-state towards which certain occupations are moving and others have arrived” (Johnson, 1972:22). Trait models of the professions usually provided a list of universal attributes or characteristics that were said to represent what is common to professional occupations (e.g., Cogan, 1953; Greenwood, 1957; Millerson, 1964). In this context, a kind of “natural history” of professionalism emerged that seemed historically specific to capitalism and industrial culture. By contrast, in the functionalist approach, “there is no attempt to present an exhaustive list of traits; rather the components of the model are limited to those elements which are said to have functional relevance for [modern industrial] society as a whole or to the professional-client relationship” (Johnson, 1972:23; cf. Rueschemeyer, 1986). Similar to the trait approach, functionalist models focused on essential or universal characteristics of professional behaviour. At the same time, functionalist accounts of professionalization concentrated on the capacity of professionals to exercise a monopoly over status in an interprofessional system of stratification; professional activities being carried out by delegation of authority and honour, and with a degree of social autonomy and self-regulation. Medicine and law appeared in the empirical field research using either of these models as “classic cases” exhibiting ideal-typical characteristics of professionalism.

After 1960, the focus of socio-theoretical discussions concerning the professions generally, and of medicine in particular, shifted away from an emphasis on collegial organization of the professions and what Andrew Abbott has called the “asymmetry of expertise,” [1] and turned to problems associated with power and competitive working relations among professionals. Preliminary discussions concentrated on issues of collective autonomy and the capacity to exercise control over individuals and social structures within and beyond the

boundaries of the professions (i.e., profession-building). Highlight was thrown on the profession as an “occupation that has had the power to have undergone a developmental process enabling it to acquire, or convince significant others ... that it has acquired a constellation of characteristics we have come to accept as denoting a profession” (Ritzer and Walczak, 1986:62). But as Ritzer and Walczak (1988:6) observed, along with a sense of the power of the professions, “came a sense of the *fragility* of that power.” While some researchers went on to study the problem of maintaining power and professional dominance, others developed an interest in material factors that limited or contained the power of professionals. Five discrete lines of inquiry can be discerned in the literature, each one implicitly or explicitly representing a distinct way of understanding working relations among professionals.

First of all, in contrast to earlier discussions that predicted that incessant professionalization of occupations would remain an important feature in industrialized societies, a number of articles and books appeared that suggested that increasing bureaucratization was limiting or reducing the range of activities and/or discretion of professionals (Wilensky, 1964; Hall, 1968; Johnson, 1972; Haug, 1973; Ritzer and Walczak, 1988). The central argument here was: As the dependency between professionals and bureaucratic administrations grew, so would the power of administrators to shape professional skills and tasks. Conversely, the market control of the professions would be weakened by the power of bureaucratic organizations offering the same services. By implication, it could be argued that there is an inverse relationship between professionalization and bureaucratic organization. Empirical evidence in the literature supported at least some of these claims. Ben-David’s (1958) study of physicians employed by the General Federation of Labor (Israel), for example, had cited widespread dissatisfaction among medical professionals critical of “bureaucratic interference” with their professional activities. In a similar vein, Goldner and Ritti’s (1967) study of American engineers in bureaucratic settings noted widespread frustration over a lack of autonomy to determine the course of their work activities. Hall’s (1968) analysis of structural and attitudinal aspects of professionalization also indicated diminished professional autonomy in bureaucratically organized settings.

At the same time, there were researchers who contended that as modern bureaucracies became sites of professional activity, administrators made important concessions to professionals (Janowitz, 1960; Kornhauser, 1962; Glaser, 1964; Bucher and Stelling, 1964; Johnson, 1972). Barney Glaser (1964), for example, observed that American scientists doing research in the private sector were able to pursue professional careers without compromising the ethos of science (i.e., the advancement of scientific knowledge). Terence Johnson (1972:83), reflecting on Ben-David’s study of Israeli physicians (1958), argued that the creation of bureaucratic and organizational contexts for the delivery of health care had facilitated a greater research orientation on the part of modern professionals in medicine. Rue Bucher and Joan Stelling, following Everett C. Hughes (1958, 1971[1960]), drew attention to the importance of role-creation and negotiation. Further to this, they coined the term “professional organization” to describe organizations in which individuals identified as professionals were able to exert a considerable measure of control and influence -- particularly with respect to the policies and operations of their own organizational sections (1967:13). In the making of professional organizations, they argued (1969:7), there are consequences that follow the form which organizations adopt: (1) there is a more or less continually unfolding internal differentiation within the organizations, which (2) arises out of differences in professional interest and

professional identity and, with differentiation along the lines of professional interest, comes (3) the potentiality of competition and conflict between sectors and subgroups. The roots of internal differentiation in professional organizations, then, lay in the divergence of professional beliefs, values and interests.

A second line of inquiry emerged with the so-called “power dominance perspective” on collective autonomy and professional control. This line of inquiry had a position of ascendancy in the 1970s, and derived from a series of papers and books on the medical profession in the United States produced by Eliot Freidson after 1968. As in earlier work on the professions, professionalism was defined “as a set of attributes said to be characteristic of professionals” (Freidson, 1970b:70). But, at a high level of generality, professionalism seems to be able to exist independently of professional status” (*ibid*). With specific regard to medicine, Freidson argued that the organized autonomy of medical practitioners had broadened into dominance over kindred occupations. Furthermore, the exercise of autonomy had prevented outside interference and supervision. At the same time, the profession of medicine had failed to exert formal control over members, relying instead on the informal private ostracism of non-compliant members.

In the three decades since Freidson began work on the professional dominance perspective, two other notable approaches to the problem of professional autonomy and professionalization have been offered by Magali Sarfatti Larson and Andrew Abbott. Larson’s (1977) approach studies the rise of professionalism in relation to social stratification, and the importance of qualifications and expertise in market economies. Professionalism is “an attempt to translate one order of scarce resources -- special knowledge and skills -- into another -- social and economic rewards” (1977:xvii). Specialist knowledge constitutes an “opportunity for income.” More to the point, monopoly of expertise in the market constitutes a kind of market control; monopoly of status facilitates social mobility in a system of stratification. Like Freidson, Larson’s professionals band together in order to standardize and control the dissemination of the knowledge base and dominate the market in knowledge-based services. Having achieved a certain level of market control and social mobility, they enter into a regulative bargaining relationship with the state, allowing them to standardize and restrict access to their knowledge, to control their market and supervise service relationships (Larson, 1977:71).

The abstract character of professional knowledge and its importance to the professionalization process is reasserted in Abbott’s conception of a “system of professions.” For Abbott (1988:2), “a fundamental fact of professional life [is] interprofessional competition.” What sets interprofessional competition apart from competition among occupations in general is the quality of abstraction in professional knowledge. Like Freidson and Larson before him, Abbott’s professionals engage in “cultural work” that will ensure that clients, competitors, the state and the public will acknowledge the value of expertise and service offered by the profession (1988:58).

Altogether, these four lines of inquiry mark important steps in the socio-theoretical development of professionalization theory. They are important for the breadth of their inquiry concerning: (1) the broad division of professional labour in modern industrialized society, (2) levels of amalgamation and unity among professionals, (3) the monopolization and consolidation of professional power, and (4) jurisdiction and boundary disputes among competing occupational groups in local settings. For these reasons, they are generally cited (individually or collectively) in the analytical frameworks of subsequent research on the behaviour of medical professionals,

semi-professionals, and allied health personnel. By contrast, the fifth line of inquiry represents a kind of departure from the first four lines of inquiry. It concerns itself with *intraprofessional* relations among professionals and what Rue Bucher and Anselm Strauss (1961) labeled the “segmentalization” of professional work. Segmentalization refers to “loose amalgamations of segments pursuing different objectives in different manners and more or less delicately held together under a common name at a particular period in history” (1961:326). [2]

Two aspects of this line of inquiry can be discerned here that are particularly relevant to the present study and the question of how professionals maintain control over the determination of the substance of their own work. First, the division of labour and the subdivision of work is negotiable. Bucher and Strauss (1961:326) maintained that “the many identities, many values, and many interests” involved in intraprofessional relations “tend to become patterned and shared.” The division of labour is here associated with a “growing consciousness” among professionals *and* with agreement that members will be subdivided in terms of “particular bodies of expertise” and distinguished from other members as well as other occupational groupings (Ben-David and Collins, 1966:453). At the same time, the extent to which intraprofessional relations evolve into formal specialties varies between professions (Halpern, 1988:5). So, for example, although specialty areas clearly exist in law (e.g., criminal law, family law, international law), the legal profession *as a whole* has resisted the creation of formal specialty categories. By contrast, internal differentiation in medicine is highly structured and clearly evident in formal educational tracks, certification processes, and well-defined specialist associations.

Second, occupational specialization proceeds from intraprofessional boundary settlements concerning jurisdiction of service and the organization of working environments in limited (i.e., *local*) settings (Strauss *et al.*, 1963; Bucher and Stelling, 1969; Abbott, 1988: 81, 106; Halpern, 1988, 1992; Döhler, 1993). Thus, it is of sociological interest to uncover material factors which shape individual and organizational interests in relation to, on the one hand, specialization of tasks, personnel, and roles, and, on the other, coordination of differentiated structures and functions. Here, local organizational interests in the delivery of professional services may be studied prior to formal specialties appearing (i.e., during the process of specialty formation).

Following Döhler, we can note that the empirical field research that has emerged from the professionalization literature has emphasized four key independent variables influencing specialization: (1) conceptual and technological innovations which prompt groups of physicians to concentrate their clinical activities on increasingly narrow fields of endeavour; (2) intraprofessional competition which acts as an incentive for groups of physicians to monopolize certain areas of specialty practice; (3) social and political influences directly encouraging specialization, or more indirectly, influencing the evolution and shaping of specialty services; and, finally, (4) structural and organizational aspects of health care delivery which compel physicians to participate in negotiating occupational roles and work rules. However, it is also important to note that the extent to which and manner in which each of these variables operates in specialty formation is unclear and appears to vary from one group of the specialists to the next. All of the research lend support to the argument that conceptual and technological innovations in medicine are important determinants of medical specialization. At the same time, each study has stressed one or more additional variables as especially influential. For instance, in probably the first analysis available of a medical specialty, Goode emphasized the competitive

nature of intraprofessional relations: “No occupation ... becomes a profession without a struggle, just as no specialty develops inside a profession without antagonism” (1960:902). He focused on how American psychiatrists responded to the emergence of *other* occupational groups (psychotherapists, social psychologists) offering similar services. The nascent specialty, in this case, was an offshoot from a parent specialty. By contrast, the studies of rehabilitation medicine in the United States by Gritzer and Arluke (1985) and American paediatricians by Halpern (1988) emphasized the role played by factors external to medicine in specialty formation. Gritzer and Arluke point to the increases in demand for rehabilitation services in the United States due to large numbers of war casualties requiring medical care after the First World War. Halpern concentrates on national social reform and what she calls the “professional regulation of childhood.” In both cases, history in the form of war, malnutrition, poverty, etc. is said to play a crucial role in the formation of local associative movements and state policies that encourage specialization. And, from another perspective, studies by Bucher and Strauss (1961) and Schatzman and Bucher (1964) draw attention to the ways in which a measure of order among specialty groups (psychologists, radiologists, pathologists) is maintained in the face of inevitable changes derivable from sources both external and internal to organized medicine in American hospitals.

All of these studies of specialists, it should be noted, preserve the idea that formally recognized medical specialties reflect more or less coherent sets of services from a more or less unitary perspective (i.e., professional medicine). At the same time, the data presented suggests that what look like coherent sets of services may also be viewed as loose networks of resource dependencies, personnel, and organizations which can be re-configured within the context of local health care delivery systems. Hence, we are encouraged to think about instances of medical specialization in terms of borderless or global events which will inevitably change medical practice locally. As a result, the task faced by researchers appears to be twofold: (1) to collect the necessary data to show change in terms of, on the one hand, a collective adjustment of intuitions and principles of medical practitioners at the local level, and, on the other, the sequence of network relations, associative movements, segmentalization, and other aspects inherent in the process of specialty formation; and (2) to discover major variables which appear to be of causal relevance to change.

With this twofold task in mind, I now turn to an analysis of two recent studies of medical geneticists in, respectively, the UK and Canada (Coventry and Pickstone, 1999; Leeming, 1999). Despite the fact that the two studies were conducted independently, both portray the growth of medical genetics in the UK and Canada as pursuing fundamentally similar paths of development in the decades following the Second World War. The findings reported in the research support the kind of “technology push/market and demand pull” model of growth found in other studies of medical specialists. Furthermore, with increases in demand for genetic services, one can see in both countries the sequence of segmentalization, associative movements, and other aspects inherent in the process of specialty formation. In each case, geneticists offering counselling and laboratory services in the late 1960's sought to standardize service delivery among practitioners and institute formal training regimens, certification processes, and exclusive specialist associations. And, in this regard, one sees yet another example of a medical speciality offering a more or less coherent set of services irrespective of local environmental contexts. At the same time, key concerns are raised in the research regarding how genetic services fit into the local delivery of health care. Indeed, geneticists *as medical specialists* in the UK and Canada evolved

quite differently in terms of, on the one hand, the ways practitioners adopted new knowledge and technology *locally*, and, on the other, the path those seeking specialty recognition followed on route to becoming similar to *other* specialists in scope, goals, and internal arrangements. Although medical genetics as a formally approved medical specialty in the UK and Canada does indeed point to an end (i.e., a special function for which medical genetics has come together as an area of clinical practice), medical geneticists have also been part of local associative movements seeking to maintain control over the determination of the substance of their own work. This has involved complex intraprofessional boundary settlements concerning jurisdiction of services and resource sharing relationships in local organizational settings. And it is here that the mediating effect of local institutional frameworks can be most clearly seen.

Medical Genetics in Context

The scientific roots of medical genetics lay in the rediscovery of Johann (Gregor) Mendel's laws of inheritance at the beginning of the last century which marked a major step towards resolving theoretical difficulties previously encountered in the study of heredity, and permitted subsequent investigators to think of hereditary processes in terms of inherited elements which obey natural science laws and are subject to experimental and statistical examination (Thompson and Thompson, 1966:1; Childs, 1988:2; Connor and Ferguson-Smith, 1991:3; Seashore and Wappner, 1997:4). Correspondingly, Garrod's work of the same period on "inborn errors of metabolism" has been identified as the beginning of biochemical genetic approaches to medicine and the idea that inherited disorders involve particular chemical processes (Davidson and Childs, 1981:82; Emery and Mueller, 1988:11).

The term "medical genetics" first appeared in two articles written by Madge Thurlow Macklin (University of Western Ontario, Canada) in 1932 and 1933, and subsequently in two books written by J.A. Fraser Roberts (University of Bristol, England) in 1940 and Laurence H. Snyder (Ohio State University, United States) in 1941, ostensibly as introductions to applied human genetics for medical students and physicians. The authors did not cite one another; no sense of concerted effort or collective commitment is conveyed by the texts. However, after 1950, other articles and books appeared in the U.K. and North America citing one or more of these publications. What is common among all the authors is a perceived need to educate physicians about the practical uses of genetics in medicine. These concerns can be summed up in terms of two main arguments. These pertain, first, to conceptual developments in Mendelian genetics and the practical uses of this knowledge in medical education, and, second, to the lag between theoretical and clinical capability in the application of genetics-based knowledge in clinical practice.

With regard to the first argument, genetics *as science* is portrayed as having reached a certain maturity or plateau in its development; genetics has "progressed" to the point that it is "of advantage to the medical student to become more familiar with the present knowledge of human heredity" (Snyder, 1941:3; cf. Roberts, 1940:v). Specific reference is made in the texts to Mendelian theories of genetic inheritance to explain mental disorders, eye and ear abnormalities, abnormalities of the skin, and skeletal and muscular abnormalities; heredity "as an etiological factor in the production of disease;" and, to the existence of "constitutional disorders" and "knowledge of hereditary predisposition" (i.e., diatheses and susceptibilities). Familial traits and

abnormal heredity, it is argued, do not necessarily result in rigid, unchangeable conditions in patients and, moreover, it is misleading to equate genetic disease with congenital defects. Hence, with hindsight, Arnold Sorsby, Research Professor in Ophthalmology, Royal Eye Hospital, London observed:

Recognition of the fact that some diseases are hereditary is as old as medicine itself. The observations that have accumulated in the pre-Mendelian age are indeed impressive ... but these observations tended to be regarded as collectors' items, for they were drawn chiefly from rather uncommon affections and thus lacked contact with the main body of medicine. So widespread was this attitude that the pioneers in Mendelian genetics, as applied to man, believed they were dealing with special cases when they showed that the inheritance of some human affections conformed to Mendelian laws. In spite of many such findings, it was assumed that most hereditary affections, and certainly the inheritance of normal features were determined in some other manner.

The general application of Mendelian genetics to man in health and disease has emerged only during the past two or three decades. In consequence the theoretical basis of human genetics has broadened so quickly in recent years that the original situation -- a mass of data without theoretical illumination -- has become reversed.

Nowhere in clinical studies, is theory -- *itself rapidly changing* -- so much in advance of empirical observations. *Rapid progress is thus possible and is in fact being made*, so that clinical genetics is no longer the study of curiosities, but has become essential in elucidating the common problems of health and disease. (Sorsby, 1953:v; *emphasis added*)

Sorsby's observations here are reminiscent of remarks made by Snyder in the previous decade, and Lionel S. Penrose (then at Colchester) in the decade before that:

It is assumed, on adequate grounds, that most of the great fundamental principles of heredity are now known. The work of the last forty years on a large variety of animals and plants has resulted in the establishment and understanding of these principles. It is now imperative to apply these principles to various morphological, physiological, and pathological conditions in human beings, to test their validity in such conditions. (Snyder, 1941:4; cf. Snyder, 1933)

Coming down to immediate practical issues, at least we may say with fair assurance that the future of medicine will be much affected by genetic enquiry, though it will be a long time before sufficient certain knowledge is available to justify the frequent application of genetic principles in the ordinary practice of medicine as an alternative to existing methods of controlling disease. Our knowledge is, however, adequate to warrant the enunciation of certain rules of general application which may be useful both for the guidance of eugenic prophylaxis and the facilitation of further genetic research in medicine. (Penrose, 1934:77; cf. Macklin, 1933:1335)

Second, and concurrently, genetics is frequently referred to as an "exact science." Physicians are encouraged to familiarize themselves with theories outlining the role of the

chromosomes in inheritance. Further to this, their empirical observations of clinical examples of abnormal heredity are solicited. The meaning appears to be twofold: to separate medical genetics -- and, by extension, genetics *as science* -- from non-medical (e.g., hereditarian) contexts, and to exploit the technical knowledge afforded by contemporary developments in genetics.

In the literature of the 1930's and early 1940's, early approaches to familial traits and abnormal heredity were increasingly called into question and frequently criticized as being medically ineffective, scientifically unsound, and/or simply moralistic -- and therefore unscientific (Penrose, 1934:73-4; Blacker, 1934; Snyder, 1941:4). Macklin (1931:614), for example, protested: "the very attempts to study the problem [of abnormal heredity] calmly and sanely are thwarted by the reactionaries who insist upon placing emotion before fact." Similarly, Leonard Huskins at McGill University (1938:6-7) complained: "To many medical men and others the chief interest of genetics lies in its social application. ... In this field there has, however, been so much undisciplined speculation and, often, social bias that the geneticist ... shies away from it." Thus, in the introduction to C.P. Blacker's *The Chances of Morbid Inheritance*, Sir Humphry Rolleston, then president of the Eugenics Society (U.K.), noted:

There is some confusion in the public mind about the meaning of the word eugenics; many still regard it as connoting such measures as the compulsory mating of selected individuals on the lines of the methods employed in the stockyard, or the compulsory sterilization of those somewhat vaguely labeled as unfit. To others, and among them members of the medical profession, the propaganda of eugenicists appear to have outrun the existing knowledge of the laws of human heredity. The principles of eugenics, however, can be defined in terms acceptable to most medical men who should then agree that the practice of what may be called negative eugenics is the most effective, economical, and humane of the departments of preventive medicine. (Blacker, 1934:ix)

At the same time, individuals like Penrose (1934:72-7), [³] challenged the basic assumption that the general standard of health of populations could be improved through negative eugenics strategies:

We cannot foresee the future environment of the human race, and therefore we cannot be certain what characters to breed for. It is urged that the improvement of the general intelligence of the race should be one of the most important aims, but even if we could do this by eugenics we may legitimately doubt whether the human race would be happier. The philosophies of medicine and eugenics, sooner or later, diverge. What is pleasant for the individual is not necessarily good for the perfection of the race. (Penrose, 1934:76)

The sentiment is echoed in Snyder's (1941:4) observation that ongoing advances in genetic science would provide the necessary information for sustaining positive eugenic and euthenic programs "for the protection of society in which every physician should be able to take an intelligent part, based upon experimental data, not opinion, prejudice, and overexaggerating the uncertainties."

Arguments, here, concerning the clinical application of new genetic knowledge are united *in praesentia*; medical genetics accepts any intruding element *in medicine* and concentrates all of its internal energies on the formation of structures that are highly integrative in character. The

associative activity indicated is that of integrating genetics *and* medicine. It was anticipated that the services of physicians knowledgeable in genetics would be taken up in clinical practice, particularly with regard to prognosis and preventive medicine (Macklin, 1931:614; Blacker, 1934:v-vi; Penrose, 1938:71-4; Huskins, 1938:8; Roberts, 1940:v-ix; Snyder, 1941:3-4), counselling on prospective marriages (Snyder, 1941:4), counselling on prospective pregnancies (Macklin, 1933:1337; Roberts, 1940:258-64; Snyder, 1941:3), and medical-legal applications of blood-grouping (Snyder, 1941:3; Wiener, 1943). Furthermore, after 1940, manuals and handbooks on medical genetics appeared that organized their contents to reflect areas of medical specialization (e.g., pulmonary, cardiac, neurologic, haematologic, urogenital). Thus, a kind of bifurcated ideological construct [⁴] emerged in the UK and North America [⁵] that shaped and informed the means of organizing what would later be called a “genetics-based approach to disease” (Riccardi, 1977; 1979; cf. Hickman, 1980:246). It was an ideological construct that said, on the one hand, the mandate of medical genetics was to add a new set of medical procedures to the clinical repertoire of individuals trained as medical doctors. On the other hand, it said that in the event that doctors *in general* are unable to provide such medical procedures, a class of *specialists* (i.e., medical geneticists) would be needed.

The eventual growth and recognition of medical genetics in the UK and Canada that occurred after 1950, in fact, came about less directly as a result of ongoing conceptual developments in the field of genetics and more as a result of technological advances in the form of, first, new laboratory technologies for identifying chromosomal anomalies and genetic metabolic disease, and, second, the advent of regional newborn screening programs and increased use of amniocentesis in prenatal diagnosis. In both countries, the intellectual and specialist movements that supported this growth were emergent phenomena, created, split, and reattached to different groups of actors, and reconfigured at least twice over the next four decades. In each instance, new kinds of working relationships appeared; sets of diverse actors in university-hospital settings coalesced into a new collectivity; and, as a collectivity, actors defined and/or redefined occupational roles and work rules. In the first instance, an elite of PhD- and MD-geneticists built career paths through their work in newly established clinical settings for genetic advisory services. These individuals established specialized work patterns by combining hospital work and teaching posts. Moreover, they drew a clientele of patients on the basis of personal reputations for specialized expertise. In the second instance, counselling and laboratory services became standardized and specialized occupational roles and work rules for clinical and laboratory services were established. In the translatory movement from medical segment to medical specialty, the ideological direction of clinical practices conformed to a pattern widely adopted among contemporary medical specialties. As a result, a formal job classification -- medical geneticist -- became viable as a full-time occupation in medicine in the UK and Canada.

In the 1940's, genetic counselling on the basis of Mendelian laws was largely provided in these countries by individuals who were not employees of hospitals. These were individuals with appointments in university departments who provided consultation services to physicians and/or families concerning the calculation of empiric risks of recurrence rates of certain heritable conditions. Almost all of these individuals had science backgrounds in genetics (i.e., PhD-geneticists) and worked in university paediatrics departments where they found a level of sympathy for their interest in families at risk for hereditary illness and the management of risk among family members. Referral for consultation was largely based on personal reputations.

In the early period, the growth of genetic services and clinics occurred in an *ad hoc* and

piecemeal fashion. However, in both the UK and in Canada, the clinics received a boost after 1960 with the addition of new laboratory services for identifying chromosomal anomalies and genetic metabolic disease. The development of karyotype analysis in the 1950's permitted some types of major chromosomal abnormalities, including missing or extra copies of a chromosome or gross breaks and rejoinings (i.e., translocations), to be detected by microscopic examination. By the late 1950's, the syndromes of Down, Turner, and Klinefelter were correctly karyotyped and women with triple-X identified. Correspondingly, innovations in biochemical analysis in the same time period made it possible to test for a number of inborn errors of metabolism, thus facilitating the development of screening regimens for the early detection of such disorders as phenylketonuria, aminoacidopathies, galactosaemia, fructose intolerance, and tyrosinaemia. These technological innovations combined with the organization of regional newborn screening programs in the 1960's and increased use of amniocentesis in prenatal diagnosis in the 1970's meant that consultants experienced an increase in demand for genetic advisory services and, consequently, an increase in workload. As a result, concerted measures were taken to not only secure more resources and expansion for existing services, but to elevate the level and quality of services across, on the one hand, National Health Service (NHS) regions in the UK, and, on the other, provincial genetics centres in Canada.

With the increase in demand for genetic services, one can see in both countries the sequence of associative movements, segmentalization, and other aspects inherent in the process of specialty formation typically recounted in the social histories of medical specialties (e.g. Halpern, 1988:154; Bucher and Strauss, 1961; Bucher, 1972[1962]; Schatzman and Bucher, 1964; Gritzer and Arluke, 1985). In both cases, geneticists offering counselling and laboratory services found themselves spending proportionally less time in academia and research, and more time worrying about what was going on in the clinics. More pointedly, geneticists who provided counselling and laboratory services in the late 1960's became more self-conscious about their patterns of work in professional medicine. Increasingly, two key questions were raised in professional circles: How does medical genetics fit into the delivery of patient care? How do geneticists *as medical specialists* incorporate *other* specialists and *non-medical* personnel into their own schemes of work and aspiration? Both of these questions, in time, found expression in an assortment of concrete efforts to establish some kind of formal mechanism to create and maintain standards for the delivery of genetic services at the local level.

Whereas initially medical genetics as an area of clinical practice (in both the UK and Canada) was described in terms of a multidisciplinary undertaking involving medical and non-medical personnel (i.e., MD-geneticists, PhD-geneticists, laboratory staff, allied health personnel), associative movements to establish formal mechanisms to create and maintain standards for the delivery of services increasingly focused on the question of who should be permitted to be service providers. Subsequently, applications to the respective professional (Royal) Colleges (of Physicians and Surgeons) to recognize medical geneticists as formally approved medical specialists resulted in the creation of pools of almost interchangeable individuals who occupied similar positions across a range of organizational settings and possessed a similarity of orientation and disposition that would eventually override variation in their backgrounds. In each country, for example, primary certification for medical geneticists as medical specialists meant the emergence of distinct training programs in medical schools, and a separate occupational class of allied health personnel called "genetic counsellors." PhD-geneticists, by contrast, were largely displaced in terms of a clinical role. They have continued to

find employment teaching genetics in university medical faculties, doing research, and as laboratory directors. As a rule, however, they are no longer involved in counselling patients. Only doctors (i.e., MD-geneticists) and genetic counsellors see patients. Further to this, one clear feature of the development of genetic services as specialty services has been the separation of the genetics clinics, where MD-geneticists and genetic counsellors do their work, from laboratory facilities, where PhD-geneticists do research and laboratory services are provided for multiple service areas and clinics in hospital settings.

With regard to the division of labour in the delivery of advisory services in genetics clinics, two broad sets of activities can be discerned in either country that involve the geneticist in the capacity of consultant. The first set falls under a general category of prenatal care in pregnancy and childbirth, and overlaps with the jurisdictional claims of obstetrics and gynaecology. This set of activities can be distinguished from “general genetics,” which is a catch-all category for clinical activities involving infants, children and adults. As a set of activities unto itself, it can be further divided into three sub-sets. Activities in the first sub-set overlap with the jurisdictional claims of neonatology. This involves the diagnosis and management of congenital anomalies and diseases in newborns. The second sub-set takes up broader paediatric concerns and focuses on the diagnosis and management of genetic conditions in children. Finally, the third sub-set deals with, on the one hand, the diagnosis of adult-onset diseases and, on the other, screening for carriers of heritable conditions. In this regard, the character of the jurisdictional interface with *other* specialists (i.e., *non-geneticists*) shifts paradigmatically depending on whether the proband [⁶] is a pregnant woman, an infant, a child, or an adult.

At a high level of generality, the broader concept of genetic services involves resource relationships that extend beyond the confines of individual service centres. Each centre, though of great importance, is but the nucleus of an extended pattern of these interrelationships. In its simplest spatial aspect, genetic services are comprised of two generalized unit parts, service centre and the adjoining catchment area. The two develop together, each presupposing the other. But while the centre is compact and readily visible, the catchment area is diffuse and almost defies precise observation. Genetic services, in this context, represents a series of concentric zones around service centres which differ in the degree of attachment of their occupants to the centres, of the frequency of movement of patients or patient information to and from the centres, and in the extent to which contacts with the centres are, on the one hand, direct, involving the movement of individuals, or, on the other, indirect, involving a circulation of information and specimens rather than people. At the level of organizing regional services in the UK and Canada, notably, fundamental differences lay in the patterned and temporal features of the ways resource sharing and personnel are re-configured within the context of local health care delivery systems.

The way genetic services are organized appears to be more consistent across clinics in the UK than in Canada. Whereas clinics in Canada have evolved and grown at different rates in accordance with the institutional morphologies of genetic services at the particular hospitals housing them, greater emphasis has been placed on offering integrated and cost-effective services in the UK. Most conspicuously, national policies and the health care reforms of the 1970's figure prominently in the UK study. Coventry and Pickstone argue that the growth of services in this period “are illustrative not just of changes in genetics, but of wider changes in the [National Health Service] which were (loosely) associated with the 1974 reforms” (1999:1228). Attention is drawn to how these changes brought about, on the one hand, the partial

reconstruction of interjurisdictional relations among medical specialists as a collective aggregate in the UK, and, on the other, a supportive environment for the introduction of the new medical specialty. Coventry and Pickstone show how the broader consolidation of a consultative role for the geneticist in prenatal diagnosis remained distinct from those of other specialists during the period of the 1970's and how genetic advisory services were protected from the cutbacks during the NHS health care reforms, "in part because [these services] promised overall cost-benefits." Thus,

[p]ublic health functions (other than environmental health) were moved from the local authorities into the main NHS structure; the teaching hospitals were brought within the same administration as the rest of the region's hospitals; community physicians were to plan services, partly on the basis of epidemiological surveys that would now concentrate on chronic conditions and curative medicine, including clinical outcomes; newly appointed Regional Scientific Officers were to oversee the development of technical services in all the hospitals of the Region. ...

These changes emphasized medical science, co-ordination of services and planning based on epidemiology and economy. It was hoped that the new management structure would target needs and priorities along more rational lines, and in particular, after the establishment of the Resource Allocation Working Party ... in 1975, ensure more even allocation of resources throughout the UK. Medical genetics may well have benefitted from the reorganized structure, not least because it facilitated the development in the teaching hospitals of services which could be used by all the hospitals in the region. (Coventry and Pickstone, 1999:1234)

By contrast, and so far as the determinants of specialization are concerned, neither national nor regional policies figure strongly in the Canadian case. There were only two attempts to organize and coordinate the delivery of genetic services in the form of provincial advisory committees in Alberta and Ontario. Both attempts ultimately came to an end with the disbanding of the committees in the early 1990's. [7]

For reasons of time and space, I can do little more than sketch the similarities and variations among service centres in Canada. [8] Suffice it to say that the growth of genetic services in Canada has not followed any grand design at the national or regional level. Rather, the expansion of services directly reflects local efforts on the part of the geneticists themselves to negotiate and share resources. There are currently nineteen genetics centres in eight provinces that provide advisory and laboratory services. All are located in or close to urban centres. With the exception of four centres in Ontario, all centres belong to university-hospital affiliated programs, and hence the geneticists employed by the centres are involved in teaching as well as service functions. In addition, nine provinces have outreach programs with sites to which staff from genetics centres are dispatched on a regular basis to hold clinics lasting between one and three days. Diagnostic tests for numerous genetic conditions are universally available through the genetic centres, although the full range of tests varies from centre-to-centre. All centres have access to laboratories for chromosome analysis and biochemical analysis. A range of DNA tests for particular genetic disorders are available through a network of service and research laboratories across Canada. Differences between testing facilities are made up for largely through informal inter-centre service arrangements.

The ways genetic services are administered in Canada vary widely. The delivery of laboratory services usually falls under the budget of a laboratory services department. Services may be administered by pathology departments or medical genetics divisions. Or the costs of particular tests may be absorbed into the laboratory budgets of researchers studying specific conditions in specific illness groups. The salaries of the staff of the genetics clinics come out of the global budget of the hospitals, which in turn come from the public monies of provincial health ministries. Payment for the services of geneticists is complicated owing to differences in the academic and service functions they fulfill. Payment is never made entirely on a fee-for-service basis. Furthermore, each occupational grouping involved in the delivery of services consists of individuals who have received noticeably different kinds of training, and each occupies some differential hierarchical position at the centre while playing a different part in the total division of labour. The level of training of geneticists varies and reflects different stages in the growth of medical genetics as a specialty area in Canadian medicine. Some have Canadian College of Medical Geneticists certification. Some have Royal College of Physicians and Surgeons (Canada) certification. Others have both. Genetic counsellors, as well, have a wide range of backgrounds, including some with formal credentials from MSc-granting programs in genetic counselling. Many of the older counsellors have nursing backgrounds, having been recruited to genetic services and “learned genetics on the job.” Finally, the division of labour between genetics clinics and other specialty areas in the hospitals also varies. Interjurisdictional relations are negotiated in a manner reminiscent of what Anselm Strauss (1978:224-33) called “silent bargains” and “implicit negotiation.” [9] Direct confrontation between specialists has been avoided when the origins of a patient’s problems are known and effective diagnostic testing and treatment regimens are in place. In these cases, specialists and specialized workers outside of the jurisdiction of medical genetics will do the bulk of the counselling concerning the genetics of the condition at hand, and all of the medical management. The genetics clinics serve as a resource or back-up when the circumstances are difficult to interpret, or when genetic expertise is required concerning the implications of the condition for other family members and with respect to family planning. The situation changes, however, when the origins of patients’ problems are unknown. In each case, the sequential mobilization of specialty areas seems to develop over time according to its own internal dynamics. Partly as a result of institutional morphologies and the accompanying differentiation between specialty areas and clinics, the resulting networks of trajectories of patient care are contingent and iterative, functioning at varying levels of effectiveness and success.

In sum, the patterned and the temporal organization of genetic services in the UK and Canada reflect different levels of interplay between autonomous action and constraining structure in local settings. On the one hand, geneticists do what is expected of them, i.e., they behave “in ways that they have learned to expect that they should behave” (Strauss *et al.*, 1963:162). Geneticists have learned to conduct themselves in accordance with the same proscriptions that stem from the morphology of service relationships at the particular institutions employing them. Yet, the geneticists interviewed in these studies also maintained that *as medical specialists* they provided services in a manner that was similar, if not the same, as others in their field around the world. Accordingly, it is important, from a research standpoint, to distinguish between what are here ideal-typically the features of medical genetics and factors affecting the way that specialty services are delivered locally from service centre to service centre.

Concluding Remarks

From what has already been said in past research on the subject, medical specialism operates as a kind of organizational politics in the broadest sense, referring to the complex of influences that determine the forms of relations within a given environment. This suggests what might be termed an internal politics among specialists which exercises its own specific and pervasive power outside of what transpires by way of external influences. Indeed, we can see in the two studies of medical geneticists discussed in this article that there comes a point when *de facto* groups of specialists promulgate ideal-typical standards of practice according to which their specialty area is subsequently structured. Accordingly, it can be argued that once a specialty area becomes well established in the world of medicine (i.e., organized medical practice as global phenomena), there is an inexorable push *at the local level* towards homogenization (cf. DiMaggio and Powell, 1983: 148). Medical specialties only exist to the extent that they are institutionally defined. The push towards homogenization occurs with: (1) an increase in knowledge and technology with which local service providers must contend; (2) the development of a mutual awareness among local practitioners that they are involved in a common enterprise; and (3) the emergence of closely defined obdurate structures and standards of practice. In the long run, local groups of specialists construct around themselves an environment that provides the resources needed to ensure that clients, competitors, the state and the public will acknowledge the value of expertise and service offered by them as specialists. Thus, a medical specialty *in its totality* (i.e., the specialty as a global phenomenon) is not by nature and by theoretical definition independent of local versions of specialty services and practices. Instead, it is closely tied to these. The nature of its relation is one of homogenization to influence local versions of specialty services and maintain a uniform self-conception of the specialists labouring within the specialty area. Paradoxically, this set of relations is what gives a medical specialty the deceptive appearance of autonomy *from a unitary, global perspective*. As such, the intricate and complex problem of attending to similarity as well as to variation among local versions of specialty services and, in particular, to change in the degree of homogeneity or variation over time becomes a matter of importance for empirical investigation.

To what extent, then, is the case of medical genetics representative of what typically occurs in medical specialization? Is it just an illustration of one possible configuration of the specialization process? Are the circumstances surrounding the process generalizable in the context of studying medical specialists in general? First and foremost, we must take into consideration that medical genetics is a medical specialty in formation. Past research on medical specialization has focused on specialties that already have institutional histories of some kind or another for a century or more, often describing seamless, linear flows of events from scientific and technological innovations and standardized training programs to the achievement of collegial approbation and free-standing specialty status. In this regard, each nascent specialty has been treated as a “heretofore nonexistent division of labour” (Halpern, 1988:19). The two studies of medical geneticists discussed in this article suggest to me that the process of medical specialization is not so cut-and-dried, and that more time and effort needs to be spent investigating the *stability* of local groups of medical specialists as nascent specialties, and, relatedly, the ability of specialty groups to preserve and maintain obdurate institutional structures over time.

We can take note that a seemingly unending stream of gene discoveries are producing more and more diagnostic tests for genetic disorders and adding to the medical geneticist's clinical "toolbox." Indeed, contemporary geneticists interviewed in the UK and Canadian studies, like proponents of medical genetics in the 1930's and 1940's, believed that the development and growth of medical genetics will remain integrally linked to broader paradigmatic shifts (*à la* Kuhn) in science brought about by advancements in genetics. Interviewees eagerly predicted prospective diagnostic and therapeutic benefits of research programs (most notably the Human Genome Project) associated with efforts to map and determine the sequence of genomes, and to study the biological function underlying sequence data. One of the Canadian geneticists predicted:

[In the future, genetic] information is going to be available to everybody. You won't need a doctor to get your genetic blueprint. You'll send your blood sample to a lab -- if you want to -- and for a certain amount of money, they'll give it to you. And then you'll go into the Internet and scan [it]. You know, you'll say, "What is my variation? And what is known about this variation?" (Leeming, 1999:252)

In such a scenario, "you" would presumably need a point of reference to interpret "your genetic blueprint." That is to say: You may not need a doctor to get your genetic blueprint, but you will need to access certain knowledge in order to understand the significance of the information. But who will possess such knowledge? What I have described as the bifurcated ideological construct of medical genetics says that in the event that health care providers *in general* are unable to provide such information, *specialists* will be needed. Contemporary geneticists in the UK and Canadian studies were quick to point out that most health care providers were inadequately equipped to dispense information to patients concerning the genetics of their conditions. Medical geneticists are thus like *illuminati* bridging a gap. But, at the same time, it is important to note that clinicians in *other* specialty areas are increasingly providing information to patients concerning the genetics of their conditions (Stuurgroep Toekomstscenario's Gezondheidszorg, 1987; Connor and Ferguson-Smith, 1991; Motulsky, Robbins, and Murray, 1994; Seashore and Wappner, 1997). For these specialists, new diagnostic tests that pertain to the diseases they treat clearly represent significant additions to their clinical toolboxes. And surely the ever increasing developments in genetic knowledge and technology act as inducements for more and more health care providers to jump on the bandwagon of the "genetic approach to medicine." In this respect, it seems plausible that, with time, the role of the medical geneticist as specialist will not expand, but withdraw as more and more medical practitioners take on the "genetic approach to medicine." Interestingly enough, many geneticists in the Canadian study said that they supported such a scenario. They took an almost fatalistic attitude about the future. Consider, for example, the following quote:

The happiest day I could envision ... is when the clinical genetics departments close. And geneticists stop seeing the relatively routine kinds of patients. Because when that wonderful day arrives, that will mean that we have a decent teaching program in genetics in medical schools. And they don't need us -- except as sources of information; as people who can take the new and exciting developments in research and communicate them to the our clinical colleagues. ... That day will eventually more or less come, with some

notable exceptions: The metabolic diseases, I think, are so complicated that they will always be looked after by metabolic specialists. ... But many of the conditions that we follow, we really shouldn't be doing. I think that we should be acting as consultants who know how to establish the appropriate diagnosis using the exotic and not-so-exotic testing procedures that are available. Then the patient should go back to his or her family physician, paediatrician, or whoever, for the follow-up, and that person should be organizing whatever specialties are needed. (Leeming, 1999:254)

The quote is consistent with what other interviewees had to say about the future of medical genetics as a medical specialty: Geneticists *as medical specialists* will not, like proverbial "old soldiers," fade away. They will, rather, continue to act as consultants on the basis of personal reputations for specialized expertise. But, this raises a pressing question: How will geneticists currently involved in clinical practice keep abreast of developments in science in order to "take the new and exciting developments in research and communicate them to ... clinical colleagues"? Are the clinical and scientific arms still interconnected? The UK and Canadian studies show that occupational specialization in the broader field of genetics and medicine has undergone remarkable divarication in a relatively short period of time. The role of the geneticist in medicine has evolved to a point where there is little or no interchangeability between clinical- and laboratory-based functions. Simply put, clinically-based geneticists (i.e., MD-geneticists) and laboratory-based geneticists (i.e., PhD-geneticists) do entirely different jobs.

Respondents in the Canadian study who were clinical geneticists and who had started their careers doing laboratory work, commented that they could not go back to the labs; they were "out of the loop." By contrast, the non-physician geneticists interviewed often prefaced their remarks by saying that they were not *medical* geneticists. They pointed out that genetic research *in medicine* continues to not only expand in the area of rare genetic disorders but also with respect to more common conditions associated with cancer, diabetes, heart disease, and the effects of aging. As research scientists, they involved themselves with all sorts of clinicians that oversee the medical management of patients. The salient point here is that geneticists as *medical specialists* are not the only specialists involved in the so-called genetic revolution in medicine. Medical geneticists can expect to be involved in *some* but not *all* of the spin off of the revolution. Certainly, they will remain important in the future in highly specialized areas of expertise. But they will also inevitably be "out of the loop" in other areas of practice, and with respect to taking "the new and exciting developments in research and communicat[ing] them to ... clinical colleagues."

Summarily, the picture that emerges from all this is that medical geneticists can *presently* feel secure in the knowledge that they will not be displaced from the practice of medicine as specialists. And this will not change in the foreseeable future. At the same time, medical geneticists envision "genetics as pervading all of medicine." As *experts*, they assume the role of consultants where medicine *in general* crosses into the territory of genetics. They look upon themselves "as people who can take the new and exciting developments in research and communicate them to ... clinical colleagues." But it remains to be seen to what extent they will be involved in rendering open and intelligible the grounds for "a genetic approach to medicine" in the future.

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Notes

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1. From a trait or functionalist perspective, various institutional forms (i.e., associations, licensure, and ethics codes) are required of institutions to address the "asymmetry of expertise." As a result, the client can trust the professional and the professional respects both client and colleagues (Abbott, 1988:5).
 2. The concept of "segmentalization," of course, pre-dates Bucher and Strauss, going back to the "human ecology" literature of the Chicago School. In particular, Robert E. Park (1936) and Louis Wirth (1938) used the concept to describe the segregation of population groups according to commonly held cultural characteristics.
 3. See, also, Hogben (1933), Muller (1935), Haldane (1938).
 4. Following the example of Robbins and Johnston (1976:353), I use the term "ideology" in

a restricted sense. It refers only to “those systems of closely related beliefs, ideas and attitudes” that exist among the groupings of medical professionals and scientists studied in this article. It is not here used in its broader sense, i.e., as a *Weltanschauung*. I am interested only in how medical geneticists make sense of “medical genetics” and seek to further their collective professional aims.

5. The reader will have noticed that I have included references to American geneticists in this article and questions naturally follow concerning the American influence on Canadian geneticists. Indeed, an important part of the history of genetics and medicine in North America involves a rich exchange of ideas and resources between Americans and Canadians in terms of both training and clinical practice. But it is important to note that, with specific regard to the process of specialty formation, Canadian geneticists were first in North America to create a formal organization to represent their interests. The creation of the Canadian College of Medical Geneticists (CCMG) in 1976 precedes its counterpart in the United States, the American Board of Medical Genetics (established in 1991). It is a completely Canadian entity in the sense that it is not linked to or modelled on a foreign organization.

Interviewees in my Canadian study bristled at any suggestion that the CCMG and genetic services in Canada might have been modelled on foreign sources -- particularly American. For instance, one interviewee commented:

There weren't any models. [The Americans] followed us. They often do, you know. ... I think -- and I am not including myself in this -- there was really some foresight as to what was going to develop in genetics in Canada. In the late >60s, early >70s, [a number of Canadians were] leaders in the field in those days. I don't think we should undervalue what we have done in Canada because America is a bigger country. You know? It's often easier to organize things in a smaller pond. (Leeming, 1999:257)

Further to this, one can note the American reaction to Dr. Clarke Fraser's announcement concerning the formation of the CCMG at the 1976 National Institute of Child Health and Human Development Conference on Genetic Counseling. Dr. Park Gerald of the Children's Hospital Medical Center, Boston remarked: “I really hope ... that you will be interested in the comments of those south of the border before it is finalized. I must say I speak a little defensively. You may be setting a pattern for all of us without our having a chance to participate.” (Quoted in Lubs and de la Cruz, 1977:553-4.)

6. In the language of medical pedigrees and genetic counselling practice, the proband is the individual who brings a particular family to the attention of an investigator (i.e., referring physician, medical geneticist, genetic counsellor, geneticist-researcher).

7. The two undertakings to coordinate the services provincially are nonetheless of interest for the questions they raise concerning, first, the variety and variability of local needs within arbitrarily conceived organizational boundaries, and, second, the usefulness of having external bodies in place to review the breadth and scope of service delivery with reference to uniformly applied criteria of efficiency and rationality.

8. A detailed description of Canadian genetics centres, their staff and services is available in

chapter six of my unpublished dissertation (1999).

9. Strauss (1978:224) distinguished between “transactions openly carried out between parties who recognize their own negotiating” and negotiations that are “implicit, their products being tacit agreements or understandings”:

The main issue is ... that actions are being taken with respect to nonnegotiated limits imposed or signalled by one side and agreed to directly by the other. These kinds of silent bargains, then, would seem to pertain to agreements that are not much brought into explicit discussion and that represent limits *within* which negotiation can go on.

Sometimes they go on in *support* of the limits, or they temporarily *stretch* the limits. (1978:227-8; emphasis in original)