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THE DEVELOPMENT OF CAPITALIST
PRODUCTIVE RELATIONS IN MINING

STAPLES AND THE DEVELOPMENT OF
THE CAPITALIST MODE OF PRODUCTION:
A STUDY OF MINING IN CANADA
1845-1920

By

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ABSTRACT

A substantial amount of writing in Canadian Political Economy has emphasized the colonial/dependency relationship of Canada to Europe and the United States. The development of Canada has, in this schema, been viewed as a product of international systems of trade in raw materials and finished goods, such that the character of a given society, the type of social relations, its "state" of development, etc., are determined by the peculiar nature of the product(s) (staples) being traded. The theory shares, in essence, a number of similarities with those of mercantilism, by stressing the relationship between trade and wealth with respect to the development of society. In this thesis the question of staple production is approached in a somewhat different fashion; focussing on mining as a specific case of study. The development of mining in Canada is dealt with in relation to two basic concepts: (1) modes of production, including the process of transtion, and (2) the process of capital accumulation on a world scale. This development is viewed as being associated with the Canadian Industrial Revolution, with emphasis on the changing and developing relations between producers and non-producers interacting with the corresponding level of technological development. Under such circumstances the Industrial Revolution, as well as involving an increasing application of machinery, involved fundamental transformations of the relations between producers so that changes at the level of the organization of production occurred, both with respect to the possession of mines, and the actual organization of the labour force in mining. Further, in the discussion, the Industrial Revolu-

tion within Canada is linked also to the developing international capitalist system. It is argued that the peculiar character of the development of mining in Canada was conditioned by the expansion of the capitalist mode of production, not only within national boundaries, but as a process of accumulation increasingly on an international level.

PREFACE

The question of the development of a capitalist society such as Canada has been analyzed by means of various theories. Canadian social sciences have generally dealt with this problem from a perspective commonly known as the staple theory. This theory has been developed in a number of fashions, although such varying formulations share the basic assumption that development was linked to the trade in staple commodities. Staple production is viewed as having shaped the development of the social relations of production and of the development of the productive forces--with such development, in turn, being dependent upon demand arising in the colonial/imperial market system. It appears to share the fundamental tenets of mercantilist theory--of value based on trade or exchange. Further, investigations have been made into the possibility of synthesizing the staple approach with major theoretical models associated with economic development and dependency that have been constructed elsewhere. Of these, two in particular should be mentioned: (1) developmentalist theories and (2) dependency theories. A number of authors have noted similarities between the staple model developed by W.A. Mackintosh, and the "Take-off" hypothesis of W.W. Rostow, a model from within the developmentalist tradition. These authors, however, while noting similar characteristics within the "new countries", illustrate that economic development and expansion have been attributed by the respective models to different and, at times, countervailing forces. The general conclusion was, apparently, that it would be highly unlikely that synthesis could be achieved.¹

placed on the feudal, petty commodity, and capitalist modes, and on the process of transition between the modes.³ Discussion on the respective modes of production illustrates that every mode is characterized by particular relations of production (relations between producers and non-producers), and corresponding material forces of production (that is, labour process and technology). In developing the concept, stress is also placed on the dynamic arising from the developing, and yet conflicting, social relations of production; that modes of production do not represent "ideal-typical" conceptualizations, but rather incorporate a historically specific dynamic process of transition.

The second major concept associated with the theoretical framework of this thesis is that of capital accumulation on a world scale, which has been developed from the "world system" or dependency approach--in particular, by Samir Amin.⁴ While dependency theory and accumulation theory are parallel in that attention is focussed on the linking of development/underdevelopment to a world system dominated by capitalist productive and exchange relations, with dependency theory the emphasis is on exchange relations between core and peripheral nations. On the other hand, accumulation theory involves a more concrete analysis of the relations of production (relations between producers and non-producers) within the capitalist world system. Such an analysis, therefore, links the relations of production within the periphery (regardless of the particular mode of production) to the development in the metropolitan nations of the capitalist mode. By focussing on the internal class formations within the periphery, hinterland/metropolis takes on a new significance. The location of a national unit within the "world system", which, within the dependency

The similarities between the staple approach and dependency theory derive particularly from work within the Innisian tradition of staple theory. Both models, it will be illustrated, emphasize colonial/dependency relationships between peripheral (hinterland) and core (metropolitan) nations. In regard to dependency theory, it lies between the industrialized nations of Europe and North America; while with the staple model, Canada is seen as dependent on France, Great Britain, and the United States. The list of writers who have attempted to synthesize the two approaches has included² Mel Watkins, Kari Levitt, and Robert Laxer. Such attempts at a synthesis, however, have apparently been unable to overcome the problems of value posited at the level of circulation--value viewed as arising at the level of the exchange of commodities.

In this thesis the question of development is posed at the level of the relations of production (the relations between producers and non-producers), dealing with development as it relates to the process of transition from a pre-capitalist to a capitalist mode of production, and the process of transformation within the capitalist mode. Such a process of development is emphasized as occurring on an international level, with the increasing expansion of the capitalist mode of production occurring on a world scale. In order to illustrate the relationship between the production of staple commodities and the development of the capitalist mode of production, an analysis of mining in Canada serves as a case for study.

To analyze mining a theoretical framework, introduced in Chapter I, is developed, emphasizing the following concepts: (1) modes of production and (2) the accumulation of capital on a world scale. In using the concept of modes of production, a concept which has a long tradition, emphasis is

theory was based on exchange balances, becomes a matter of the class structure. Location is a question of whether there occurred a continual expansion of the capitalist mode of production and capitalist productive relations (whether a national economy is "disarticulated" or "autocentric").

Chapter II, which appears at first to be somewhat of a departure from the balance of the thesis, serves as an illustration of the various approaches and assumptions of staple theory. In particular, discussion emphasizes the mercantilist arguments of the staple approach--development associated with value based on exchange of staple commodities within a world market.

In Chapter III the development of mining is analyzed in light of the theoretical framework developed in the first chapter. The treatment of the development of mining involves placing attention on the development of the productive relations and forces of production within the feudal, petty commodity, and capitalist modes of production; with such discussion being somewhat descriptive. Discussion of the relations of production and forces of production within the respective modes concentrates on the character of productive relations (i.e., the forms of ownership, possession, and organization) and the corresponding level of technological development (i.e., nature of the work process, development of methods and machinery). Such interest, however, stresses the dynamic process involved with the conflicting nature of productive relations within mining, both in terms of each individual mode of production, and the conflicts arising among the developing capitalist, petty commodity, and declining feudal modes.

The fourth chapter, one which is almost entirely descriptive, outlines the development of mining in Canada. Unlike the previous one, Chapter

IV treats the development of mining within Canada chronologically rather than in terms of modes of production. The periodization of its development, however, is portrayed in light of the development of the capitalist mode of production. Discussion, therefore, is divided into three sections in order to stress the level of development of the capitalist mode, beginning with the period which has been associated with the dominance of mercantilist interests. It is illustrated that during this period mining operations, like other colonial industries, were generally very primitive, with heavy constraints arising from the feudal-absolutist and mercantilist forces of the metropolitan centres (France and Great Britain) dominating the colonies. The second period outlined has generally been associated with the Industrial Revolution in Canada, from approximately 1845 to 1890.⁵ It is demonstrated that, throughout this time, not only did there occur an expansion of mining as the constraints of mercantilism lessened, but, along with such expansion, changes were occurring at the level of productive relations and productive forces. The expansion of mining, it is further illustrated, occurred within the context of both the capitalist mode and the petty commodity mode of production. The third time-period discussed in this chapter represents the era in which forces leading to the consolidation and growth of monopoly capital within Canadian mining. It is further illustrated that, in conjunction with such developments within the capitalist mode, there was taking place a corresponding decline of the petty commodity mode of production. With the growth of monopoly capital associated with mining, there continued to occur changes at the level of productive relations and forces, changes that shifted control increasingly over work activity from the immediate producers to the interests of capital. The decline of the petty producers particularly highlighted this change.

The concluding chapter serves to demonstrate the significance of the development of mining in Canada, as is illustrated in Chapter IV, in regard to the theoretical framework developed in Chapter I. Discussion, therefore, returns to a somewhat more abstract level, linking the developments within mining to the broader processes associated with the development of the capitalist mode of production, both within the national boundaries, and as part of the expansion of the capitalist mode of production increasingly on an international scale. Thus, Chapter V links together Chapters I, III, and IV.

NOTES

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2. Mel Watkins, "The Branch-Plant Condition", in A.K. Davis (ed.), Canadian Confrontations: Hinterland vs. Metropolis. (1969), pp. 34-42; Kari Levitt, Silent Surrender: The Multinational Corporation in Canada. (Toronto, 1970); Robert M. Laxer (ed.), (Canada) Ltd.: The Political Economy of Dependency. (Toronto, 1973).
3. The concept of modes of production is associated with works of the Marxist tradition. Among them, see: Karl Marx and Friedrich Engels, The German Ideology. (New York, 1947); Karl Marx, A Contribution to the Critique of Political Economy. (New York, 1970); Karl Marx, Grundrisse. (Harmondsworth, U.K., 1973); Maurice Dobb, Studies in the Development of Capitalism. (New York, 1947); R. Hilton (ed.), The Transition from Feudalism to Capitalism. (London, 1976).
4. Samir Amin, Accumulation on a World Scale. (New York, 1974); Samir Amin, Unequal Development. (New York, 1976).
5. Among the works that have examined the question of an Industrial Revolution within Canada and the nature of production prior to it are the following: Stanley Ryerson, The Founding of Canada/Beginnings to 1815. (Toronto, 1975); Stanley Ryerson, Unequal Union. (Toronto, 1975); H.C. Pentland, "The Role of Capital in Canadian Economic Development Before 1875", Canadian Journal of Economics and Political Science, Vol. XVI, No. 4 (November 1950), pp. 457-474; H.C. Pentland, "The Development of a Capitalist Labour Market in Canada", Canadian Journal of Economics and Political Science, Vol. XXV, No. 4 (November 1959), pp. 450-461; Steven Langdon, "The Political Economy of Capitalist Transformation: Central Canada from the 1840s to the 1970s", M.A. Thesis, Carleton University (1972); Alice Jean Lunn, "Economic Development in New France, 1713-1760", Ph.D. Dissertation, McGill University (1942).

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CHAPTER I

INTRODUCTION

One of the central problems entertained by the social sciences in Canada has been the process of industrialization in a resource-based economy. The result has been numerous interpretations which have attempted to come to grips with an apparently contradictory situation of an advanced industrial nation penetrated to an extensive degree by foreign capital, and an economy in which resource extraction has been a prominent segment; a characteristic of "peripheral" or "underdeveloped" nations. A common weakness of these interpretations, however, has been a failure to include in the analysis a comprehensive understanding of the social relations of production between producers and non-producers, i.e., between capital and wage labour. The classical theoretical framework associated with the analysis of Canadian development has been the staple approach, a perspective that will be discussed in this thesis, exploring its shortcomings and the insights of its proponents.

In writing this thesis the major purpose will be to deal with these shortcomings of analyses of Canadian development, doing so on a theoretical level. By doing so, the thesis is intended to overcome or avoid the pitfalls that have befallen a number of theories on Canadian development due to the peculiar nature of Canada's social structure, and its particular historical background. The theoretical perspective to be developed in the thesis will deal with industrialization as it relates to changes between modes of production (the feudal to capitalist modes

in particular) and the transformation within the capitalist mode of production as capital expands and develops on a world scale.

To illustrate the theory being developed, this thesis will concentrate on the development of mining in Canada during the period 1845-1920 as a reflection of the industrial revolution within Canada, a revolution conditioned by external forces. Mining during this period, particularly prior to 1900, received much less attention from economic historians¹ than other segments of the economy, such as wheat and lumber. Research into mining prior to 1900 tended to centre on regional and/or specific cases.² It was toward the end of the period, between 1900 and 1920, that a sudden expansion of mining drew the attention of economists and economic historians. This interest was sparked by the Klondike gold rush, the development of the Cobalt silver mines and the gold mines of Porcupine and Kirkland Lake, as well as the concentration of the mining industry in the Kootenays by the Canadian Pacific Railway. Consequently, much of the general work on mining in Canada began at some point after the Klondike gold rush--a period in which finance capital began to dominate the industry.

In concentrating on mining, the emphasis will be on the developing social relations of production with respect to the transition from a pre-capitalist to a capitalist mode of production. Such a transition resulted in mining, which was essentially a peripheral activity in an agriculturally-oriented feudal society and undertaken basically as an extension of the feudal relations of production, being transformed into an integrated segment of industrial capital. While it would be foolish to argue that such a transition from a feudal mode occurred within Canadian mining, the intention is to illustrate that the development of

mining in the particular form it took in Canada was connected to the expansion of the capitalist mode of production and the increasing accumulation of capital on a world scale (in particular, vis à vis, Great Britain and the United States).

The purpose of analyzing mining, especially throughout the period 1845-1920, is attributed to the fact that it was during this time that the "industrial revolution" occurred in Canada. This involved a transformation from an essentially embryonic capitalist, or even pre-capitalist, society to a highly-developed capitalist society. In light of one of the fundamental suppositions of staple theory--that there exists a relationship between the staple being produced and the resulting structure of society such that the staple production molds the social structure--with the transformation to an increasingly higher-developing capitalist society, there occurred a change in the nature of the staples. Such staple analyses were, however, based on studies of the "traditional staples" associated with mercantile capitalism (i.e., fur, fish, square timber, and wheat), with the emphasis on the exchange in such commodities. As the industrial revolution occurred both outside Canada and within, the "industrial staples" replaced "traditional staples" as dominant staple trade commodities. The transformation to "industrial staples" raised certain implications about the adequacy of a staple theory based on "traditional staples". Mining has been viewed as a staple extraction activity which developed into a highly-industrialized activity, involving an increasingly high development of technological innovation: it was, therefore, selected as a case for study. While the analysis being developed within the thesis raises questions with respect to the implications for other "industrial staples"

(that is, pulp and paper, petroleum, etc.), the discussion of such implications is beyond the scope of this study.

Analysis of the development and growth of mining in Canada has, on many occasions, been interpreted from a perspective commonly known as "staple theory", or the staple approach. This approach, in conjunction with proponents representing certain major currents or trends, will be discussed in more detail in Chapter II. For the present a brief outline highlighting common assumptions within the staple approach is in order. Mel Watkins, a proponent of "staple theory", has provided one of the better descriptions of the emphasis of the staple approach in the following:

The fundamental assumption of the staple theory is that staple exports are the leading sector of the economy and set the pace of economic growth. The limited--at first possibly non-existent--domestic market, and the factor proportions--an abundance of land relative to labour and capital--create a comparative advantage in resource-intensive exports, or staples. Economic development will be a process of diversification around an export base. The central concept of a staple theory, therefore, is the spread effects of the export sector, that is, the impact of export activity on domestic economy and society. To construct a staple theory, then, it is necessary to classify these spread effects and indicate their determinants.³

While proponents of the staple approach have shared to varying degrees these assumptions, the emphasis here will be on the work of Harold Innis. Other writers, too, will be examined, either for purposes of comparison, or to study how they represent trends developed from Innis' work.

A number of reasons existed for highlighting Innis. First, Innis alone, among the staple theorists, studied the mining industry in some detail.⁴ Second, along with W.A. Mackintosh, Innis is viewed as a co-founder of the staple approach. While due respect is faithfully paid

to Mackintosh by disciples of the staple approach, however, most writers have followed Innis' lead and constructed their works on "Innisian" foundations. Third, Innis (unlike Mackintosh, and, more importantly, many of his followers) had a rather wide scope to his analysis. While he, like a number of his disciples, emphasized the dependent nature of staple trade within a "colonial" market context, he also focussed on the technique, organization, and institutions associated with staple production.

Although discussion of this third aspect of Innis' work will be carried out in the following chapter, it should be indicated at this point that the ensuing discussion on mining will involve this aspect of his work in particular. It is at this level that Innis develops the relationship between trade in staples and the structure of staple-producing societies. Such trade was viewed not only in terms of the movement of commodities, but also in terms of relationships. For Innis the motor force of the society rested in the sphere of circulation of commodities. Population and economic formations were divided on the basis of political and/or geographic boundaries. Questions with respect to the classes associated with the production of staples and the "elements" on which they rested, ⁵ i.e., wage labour/capital, etc., did not enter into the Innisian framework. As a result Innis could attribute the resulting structure of society to a combination of the nature of the staple itself, geographic factors, and the staple trade within an imperial market relationship.

In discussing mining in Canada, there will be a dual emphasis to such an examination. On the one hand, discussion will revolve around the mode of production under which mining occurred. On the other hand

(and what may, at first, appear somewhat parallel to Innis), discussion will focus on the relationship of mining in Canada to that of Great Britain and the United States. While the conceptual framework for examining mining will be introduced at this point, because of lack of discussion on the concrete situation the various parts of the framework will probably appear disjointed and non-integrated. The unity of the central theme of the thesis will, however, become increasingly integrated as a more concrete level of analysis is approached.

Mode of Production

The concept of mode of production within Marxist literature has been defined in a number of similar ways. Marx, in discussing the materialist method in The German Ideology, speaks of mode of production as follows:

The way in which men produce their means of subsistence depends first of all on the nature of the actual means of subsistence they find in existence and have to reproduce. This mode of production must not be considered simply as being the production of the physical existence of the individuals. Rather it is a definite form of activity of these individuals, a definite form of expressing their life, a definite mode of life on their part. As individuals express their life, so they are. What they are, therefore, coincides with their production, both with what they produce and with how they produce. The nature of individuals thus depends on the material conditions determining their production.⁶

Marx, in this section, conceives society to be "conditioned" by the means in which its members "produce their means of subsistence". The mode of production of a social formation was, therefore, seen not only as the means by which the production of physical existence is undertaken, but as an expression of life, conditioning all expressions of this "life-process", be it political, legal, religious, ideological, etc. It involved not only what was produced, but how they produced it, as Marx

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illustrated in discussing forms of ownership.

Throughout his later work Marx continues to develop and expand upon his conception of the mode of production as it related to his analysis of the capitalist and pre-capitalist social formations:

The general conclusion at which I arrived and which, once reached, became the guiding principle of my studies, can be summarized as follows. In the social production of their existence, men inevitably enter into definite relations, which are independent of their will, namely relations of production appropriate to a given stage in the development of their material forces of production. The totality of these relations of production constitutes the economic structure of society, the real foundation, on which correspond definite forms of social consciousness. The mode of production of material life conditions the general process of social, political and intellectual life.⁸

Marx further adds that in time the existing relations of production (property relations) turn from being "forms of development of the productive forces . . . into their fetters", beginning "an era of social revolution". The resultant "changes in the economic foundations", Marx argues, "lead sooner or later to the transformation of the whole immense superstructure". It is at such a level (superstructure) that "men become conscious of this conflict and fight it out". Such conflict existed, however,⁹ "between the social forces of production and the relations of production". This basic framework Marx talks about in the above quote was expanded upon in the Grundrisse and Capital, as he developed his analysis on a more concrete level, in the context of historically-specific modes of production. Much of the discussion of mode of production on the abstract level was¹⁰ within the context of his discussion on method.

In Marx's writings, the concept of mode of production was developed in such a fashion that the mode of production represented the economic foundations of the social formation, upon which the various aspects of

the superstructure (legal, political, religious, philosophic--that is, ideological structures) are conditioned. Such economic foundation consisted of the relations of production (property relations and relations of appropriation or possession) and the corresponding material forces of production (labour process, technology).

Since Marx, the concept of mode of production has been variously defined, with greater or lesser emphasis being placed on certain aspects of it. Maurice Dobb states, quite concisely, that Marx defined mode of production as "the way in which the means of production were owned and to the social relations between men which resulted from their connections¹¹ with the process of production". As Dobb continues:

Thus Capitalism was not simply a system of production for the market--a system of commodity-production as Marx termed it--but a system under which labour-power had 'itself become a commodity' and was bought and sold on the market like any other object of exchange. Its historical prerequisite was the concentration of ownership of the means of production in the hands of a class, consisting of only a minor section of society, and the consequential emergence of a propertyless class for whom the sale of their labour-power was their only source of livelihood. Productive activity was furnished, accordingly, by the latter not by virtue of legal compulsion, but on the basis of a wage-contract.¹²

For Dobb, a particular mode of production is characterized by a specific form of ownership and possession of the means of production and the resulting social relations connected with the particular process of production. Such a conceptualization appeared to follow directly on that of Marx.

Geoffrey Kay has defined mode of production as constituting "two aspects of production: production as a material process on the one side,¹³ and as a social process on the other". The material process, in his definition, referred to the form under which material production occurred,

while social process referred to the 'nature' of social relations of production, and corresponding property relations. Kay notes such development within "all class societies" had the "regular production of a surplus" produced by one group (class) and appropriated by another, as its first pre-condition. Kay argues further, however, that the social relations associated with such surplus production and appropriation, while being determined by the material process of production, was not a reflex of material production.¹⁴

The social division of labour whereby in one epoch some men are serfs and others seigneurs, and at another, some men are wage-labourers and others capitalists, is not a technical division of labour. It does not follow automatically and inevitably from the prevailing techniques of material production. It is true that some types of production are inconsistent with some social relations of production On the other hand, the prevailing social relations of production limit technology no less forcibly.¹⁵

In Kay's analysis the mode of production is viewed as involving the interconnection of a particular form of material production with corresponding social relations of production in such a manner that these two aspects of production have a determining influence on one another. Unlike the previous definitions discussed, and the one following, Kay does not expand upon his discussion to link the economic aspect of a mode of production to the political, ideological, and other social structures. This may, in part, result from his central thesis, involving the study of the accumulation of capital internationally.

Nicos Poulantzas, in analysing the relationship between the political (State) and the economic, has provided one of the more complex, and, some might say, contentious, definitions of mode of production; that being "a specific combination of various structures and practices which,

in combination, appear as so many instances or levels, i.e., so many regional structures of this mode".¹⁶ Further, Poulantzas argues, the mode, in the last instance, will be determined by the economic, although the economic may not hold the "dominant" role:

Furthermore, the fact that the structure of the whole is determined in the last instance by the economic does not mean that the economic always hold the dominant role in the structure. The unity constituted by the structure in dominance implies that every mode of production has a dominant level or instance; but the economic is in fact determinant only in so far as it attributes the dominant role to one instance or another, in so far as it regulates the shift of dominance which results from the decentration of the instances Therefore what distinguishes one mode of production from another and consequently specifies a mode of production is the particular form of articulation maintained by its levels: this articulation is henceforth referred to by the term matrix of a mode of production. So to give a strict definition of a mode of production is to lay bare the particular way in which determination in the last instance by the economic is reflected inside that mode of production: this reflection delimits the index of dominance and over-determination of this mode.¹⁷

For Poulantzas this conception of the mode of production constitutes "an abstract-formal object which does not exist in the strong sense in reality". This is in contrast to "a historically determined social formation" as the only thing which "really exists". Social formations were seen, therefore, as "presenting a particular combination, a specific overlapping of several 'pure' modes of production . . . a complex unity in which a certain mode of production dominates the others which compose it". Any social formation is "determined by a given mode of production", the dominance of which "causes the matrix of this mode of production . . . to mark the whole of the (social) formation". The "articulation" of a specific social formation, therefore, is viewed by Poulantzas as being "historically determined" by the dominant mode of production.¹⁸

As mentioned earlier, Poulantzas holds that the matrix of the mode of production, which is specified by a particular "articulation of the instances" composing it, is "determined in the last instance by the economic". The "instances" of the mode of production, Poulantzas further maintains are "constituted by certain elements, which are invariant,¹⁹ but which in fact exist only in their combination, which is variable". Poulantzas describes these elements as follows:

These invariant elements of the economic in general are the following:

1. The labourer, the 'direct producer', i.e. labour-power.

2. The means of production, i.e. the object and the means of labour.

3. The non-labourer who appropriates to himself the surplus labour, i.e. the product.

These elements exist in a specific combination which constitutes the economic in a given mode of production, a combination which is itself composed of a double relation of these elements.

a. A relation of real appropriation (which Marx sometimes designates by the term 'possession'): it applies to the relation of the labourer to the means of production, i.e. to the labour process, or again to the system of productive forces.

b. A relation of property: this relation is distinct from the first, since it makes the non-labourer intervene as owner either of the means of production or of labour-power or of both, and so of the product. This is the relation which defines the relations of production in the strict sense.²⁰

In turn, Poulantzas argues, it is "the forms which the combination in question takes on" (the elements of the economic instance) that is the determination of a mode of production. Such combinations are characterized in turn as being "homologous" or "non-homologous", a homologous combination occurring when a "separation in the relations of property coincides with the separation in the relation of real appropriation" (possession). Non-homologous combination conversely refers to a

"separation of the relation of property" (ownership), with "union in the relation of real appropriation (possession of the conditions of labour by the direct producer);" a situation which Poulantzas sees as characteristic of pre-capitalist modes of production.²¹

Poulantzas' schema, which appears somewhat more complex than the previous two definitions, is essentially similar to the other conceptualizations. His purpose in devising such a framework, however, lies in attempting to analyse the "political", and, therefore, discussion on the adequacy of his schema for such purposes is not central to this thesis and will be left aside.²²

The purpose of this particular section has been principally illustrative, outlining the similarities and variations in usage of the concept. In this thesis, discussion surrounding the concept of mode of production will deal specifically with the economic foundations--the relations of production (property relations and relations of appropriation, i.e., possession) and the corresponding material forces of production (labour process and technology). In particular, the interconnection between the relations of production and the labour process will be central to discussion. At present such terms appear somewhat abstract; therefore, for purposes of clarity, discussion will shift to specific modes of production--feudal and capitalist--outlining their particular forms.

In defining feudalism, Dobb equates it with serfdom: "an obligation laid on the producer by force and independently of his own volition to fulfil certain economic demands of an overlord, whether these demands take the form of services to be performed or of dues to be paid in money or in kind--of work." Dobb further adds that "this coercive force may be

that of military strength, possessed by the feudal superior, or of custom²³ backed by some kind of juridical procedure, or the force of law."

Similarly, Rodney Hilton has characterized the Marxist concept of the feudal mode of production as follows:

The essence of the feudal mode of production in the Marxist sense is the exploitative relationship between landowners and subordinated peasants, in which the surplus beyond subsistence of the latter, whether in direct labour or in rent in kind or in money, is transferred under coercive sanction to the former. This relationship is termed 'serfdom'.²⁴

The feudal mode of production was characterized by productive relations in which the serf was in possession of the means of production--there exists a unity in the "relation of real appropriation". As Poulantzas has described it, the non-labourer does not intervene directly in the labour-

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process. Rather, the direct producer is in possession of the labour process. On the level of relations of property (ownership), extraction of the surplus by the landlords was by "direct politico-legal compulsion", in the form of direct labour services on the lords demesne, or in the form of

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tribute either in kind or money. Dobb was later to add that feudalism was characterized by the petty mode of production:

Basically the mode of production under feudalism was the petty mode of production--production by small producers attached to the land and to their instruments of production. The basic social relation rested on the extraction of the surplus product of this petty mode of production by the feudal ruling class--an exploitation-relationship that was buttressed by various methods of 'extra-economic compulsion'. The precise form in which the surplus product was extracted could vary, according to those different kinds of feudal rent distinguished by Marx in Volume III of Capital (labour rent, produce rent or rent in kind, money rent, which can still be feudal rent even if 'a dissolving form' of it).²⁷

If the feudal mode of production was characterized by serfdom, under the capitalist mode of production labour-power has "become a commodity"--

an object of exchange that could be bought and sold on the market on the basis of a wage contract and not under the legal constraints of serfdom. 28
The producer coincidentally, is separated from the means of production, necessitating the sale of his labour-power on the market, while both the means of production and, in turn, "the labour process have become the responsibility of the capitalist." 29

Capitalist production requires exchange relations, commodities, and money, but its differentia specifica is the purchase and sale of labor power. For this purpose, three basic conditions become generalized throughout society. First, workers are separated from the means with which production is carried on, and can gain access to them only by selling their labor power to others. Second, workers are freed of legal constraints, such as serfdom or slavery, that prevent them from disposing of their labor power. Third, the purpose of the employment of the worker becomes the expansion of a unit of capital belonging to the employer, who is thus functioning as a capitalist. The labor process therefore begins with a contract or agreement governing the conditions of the sale of labor power by the worker and its purchase by the employer.³⁰

Under the capitalist mode of production the labour process underwent a transformation of an unprecedented nature. With the responsibility of the labour process passing into the hands of the non-producer (the capitalist), the process becomes "dominated and shaped by the accumulation of capital", 31 the division of labour has become generalized. Whereas previous societies have divided work into productive specialties (occupations), with capitalist productive relations such specialties have become broken down into constituent operations. What was previously a social division of labour (division of tasks based on occupations) becomes a 32
"manufacturing division of labour."

Prior to entering into discussion on the development of capital and its accumulation on a world scale, it is necessary to say a few words on one other aspect of the feudal and capitalist modes of production--the

issue of the transition from feudalism to capitalism--particularly as it relates to mining.

In writing of the nature of modes of production a common problem, and, as a result, a source of much debate, has surrounded the issue of transition from one mode of production to another, particularly from the feudal to the capitalist mode of production. The problem of the transition appears to be of a two-fold nature. On the one hand, in conceptualizing modes of production there exists the risk of perceiving the concepts as "ideal-types" due to various differences between two societies having the same mode of production--differences in the level of development of the particular mode of production between two societies. Secondly, and somewhat related to the first issue, but on a more concrete level, is the actual transition from feudalism to capitalism--the source of much debate, ³³ i.e., the famous Sweezy-Dobb debate.

The problem of "ideal-typical" conceptualization of modes of production arises because on the concrete level there is not a simultaneous transition of all structures of a social formation; variations also exist within structures, that is, within the economic structure different segments may display relationships and labour processes not characteristic of one particular mode of production. The development of a particular social relationship of production may not have progressed as far in one segment as it has in a second. Similarly, such disjunction in development can occur between regions, as witnessed through the discussions in dependency ³⁴ and development theories. This should become more clear in discussing the transition from feudalism to capitalism.

The problem of the transition between feudalism and capitalism has, at various times, had attempts to solve it through the development

of the concept of "simply commodity production", a mode existing along with feudal and capitalist modes of production.

A concrete society at a given moment of time (a social formation) is composed of several modes and forms of production which coexist in it in combination. For example, capitalist societies at the start of the 20th century were composed of (i) elements of the feudal mode of production, (ii) the form of simple commodity production and manufacture (the form of the transition from feudalism to capitalism) and (iii) the capitalist mode of production in its competitive and monopoly forms. Yet these societies were certainly capitalist societies: this means that the capitalist mode of production was dominant in them. In fact, in every social order, we find the dominance of one mode of production, which produces complex effects of dissolution or conservation on the other modes of production and which gives these societies their character (feudal, capitalist, etc.). The one exception is the case of societies in transition, which are, on the contrary, characterized by an equilibrium between the various modes of production.³⁵

In the above quote Poulantzas attempts^s to deal with such a problem by referring to intermediate situations as forms of production, as opposed to modes of production. It is not altogether clear, however, what Poulantzas means by "form of production", since at times the term has³⁶ been used interchangeably with mode of production.

The appearance of a "form" or mode of production between feudalism and capitalism appears to vary, depending upon the particular historical condition in which this intermediate mode developed. As James O'Connor points out with respect to the United States, there existed alongside the plantation owners, mercantilists (merchant/bankers) and land speculators, petty commodity producers, that is, small (independent) farmers, artisans, or small manufacturers, small (domestic) traders, and teamsters; quite often in conflict with capital:

But there is a crucial sense in which American capitalism was the same as (and also different from) European capitalism Capitals in both the old and new worlds arose in societies in which the predominant mode of

production was petty commodity production (excepting of course slavery in general and southern slavery in particular). The development of capital in both parts of the world was a process of the decline of petty commodity production. As Marx implies in the very last chapter of the first volume of Capital, the crucial theoretical problem is to show the dialectical relationship between the growth of capitalism and the decline of independent production

What was unique about American capitalist development in this respect, as Marx recognized, was the ability of petty commodity production to keep capital at bay for a relatively long time. The fact that independent production was especially long-lived modified the character of capital when the latter subsequently emerged and triumphed.³⁷

The existence of such petty producers within Canada has been alluded to by a number of Canadian writers. Among the writers has been Leo Johnson, who speaks of such petty producers as part of the petit bourgeoisie. In discussing the petit bourgeoisie within Canada Johnson views it as being "comprised of two groups: the independent commodity producers such as farmers, fishermen and crafts-workers, and the small bourgeois business³⁸ men, such as retailers, independent salesmen and rentiers". Although not altogether clear, it appears that within his schema, Johnson lumps the independent commodity producers with the weakest fractions of the bourgeoisie (entitled "independent petit bourgeoisie") and calling the³⁹ group the petit bourgeoisie.

It is possible that this variation in the development of capitalism is related to the particular context associated with petty commodity⁴⁰ production. In Europe it arose in the context of the development of capitalism out of the remains of feudalism. Such producers were, on the one hand, struggling to emancipate themselves from serfdom, and on the other, were attempting to beat back the monopolizing tendencies of the mercantilists in controlling trade, as described by Dobb (Studies in the

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Development of Capitalism). In essence, they were caught in the middle between the feudal lords and mercantile capital.

O'Connor, on the other hand, was referring to a somewhat different situation in which the petty commodity producers have, to a greater extent, broken the relations of dependence and subjugation that the petty commodity producer in Europe was situated in, hence the term "independent commodity production". Such producers were viewed as having achieved a certain level of autonomy from the capitalist mode of production, although still in conflict with the capitalist mode.

Marx, in discussing the petty mode of production in conjunction with primitive accumulation, speaks of such a mode as existing under various "states of dependence", i.e., slavery, serfdom, etc. Marx further notes, however, that for such a "mode" to achieve its development the peasant and artisan must be private owners of their own means of labour, "set in action by (themselves)"; they must be free from constraints arising from other modes.⁴² This is illustrated by Marx with respect to the colonization activities of Britain and the development of the United States where, in the colonies, the development of "self-earned private property" acted as a fetter upon the development of capitalism by constricting the development of a wage-labour market.⁴³

While simplicity might dictate viewing the development of petty commodity production as a separate pre-capitalist mode of production, it also raises questions such as was asked by Sweezy:

A mode of production implies relations of production; these in turn presuppose classes with different social positions: serfs and feudal lords, 'free' workers and capitalists. Now what relations of production and what classes correspond to the particular mode of production postulated by Sweezy--pre-capitalist commodity production.⁴⁴

Rather than viewing the "transition" period as encompassing a totally distinct mode of production, separate from both the feudal and capitalist modes of production, such forms will be considered as constituting "capitalist germs"⁴⁵ or "the embryo of bourgeois productive relations"⁴⁶ within the old social formation; a "necessary" aspect of the process of primitive accumulation.

In discussing mining, this appears to be especially important, since the development of capitalist organization in primitive forms occurred at an early stage in the development of capitalism, particularly in Britain,⁴⁷ and appears to develop more directly from the feudal relations. The development of what may be called petty commodity production reached a significant level only in placer mining.

Throughout this section the theme of discussion has centered on the concept of mode of production; in particular, the feudal and capitalist modes, and the "process" of transition from the one to the other mode--along with the problem of conceptualization associated with the transitional "form" or "mode". Discussion will now shift to the expansion of capital on a world scale.

Capital Accumulation on a World Scale

The development of capitalism, and the existence of inequalities associated with it--inequalities of one nation or peoples vis a vis another, or of one class against another--has been a problem of analysis for liberal and Marxist thinkers alike. Analysis of the development of social systems has, in the last decade, been generally of one of two types:⁴⁸
 (1) developmentalist or (2) "world system"⁴⁹ or "structuralist" perspective. The purpose of such approaches has, in the final analysis, been

aimed at finding the root of such inequalities and attempting to provide solutions to overcome them. In order to do so, both perspectives mentioned have set up frameworks in which national and geographical units have been juxtaposed with each other in various ways, in terms of levels of economic development, i.e., Rostow's "stages of economic growth", and the basic centre/periphery framework of the majority of analyses based on the world system perspective. In this section discussion will focus first on the adequacy of these theoretical perspectives, then will shift to an examination of the problem of the "location" of such national-political entities within the "world economy" of capital. More specifically, discussion will deal with what Wallerstein terms "situating" the particular state (in this case, Canada) within the framework of the world system of capitalism.

The developmentalist approach associated with the dominant liberal ideology of the advanced Western nations has, generally, been connected with W.W. Rostow's The Stages of Economic Growth, although others have been prominent in this area. Rostow has provided possibly the most clear, most concise, yet sophisticated, statement on the nature of development from a liberal perspective. Using Great Britain as the model, Rostow constructed a system which views the process of development as being comprised of a series of stages through which each national unit must pass. Britain served as the model since Rostow felt that it was the first nation to pass through the evolutionary process leading to modern industrialization. He conceived of five stages associated with this process: (1) the stage of traditional society, (2) the preconditions for development, (3) the take-off, (4) the stage of maturity, and (5) the stage of mass consumption. Such systematization of economic development has drawn heavy criticism,

emphasizing the ahistorical nature of this approach, since the underdeveloped nations appear to have no history, while the developed nations do. (Underdeveloped nations are made to appear as being in some "original" state.) Further, Rostow's stages are not to be found in reality:

The unreality of Rostow's dynamic should not surprise us: for as we have seen, even his statics are entirely unreal; his stages correspond to no reality in the underdeveloped countries at all. How, then, could his development from one stage to another correspond to the underdeveloped world's reality?⁵²

While this discussion has not exhausted the critical debate surrounding developmentalist theory, it is my intention to shift attention to an approach which arose because of the theoretical inadequacy and the pronounced liberal ideological bias of development theory; this second approach has been broadly termed the "world system" approach.

The world system perspective is described by the person who coined the term as having:

. . . no commonly-accepted name, in part because the early formulations of this point of view has often been confused, partial, or unclear. It was first widely-noticed in the thinking of the Latin American structuralists (such as Prebisch and Furtado) and those allied to them elsewhere (such as Dudley Seers). It later took the form of arguments such as the "development of underdevelopment" (A.G. Frank, in the heritage of Baran's The Political Economy of Growth), "unequal exchange" (Arghiri Emmanuel), "accumulation of world capital" (Samir Amin), "subimperialism" (Ruy Mauro Marini). It also surfaced in the Chinese Cultural Revolution as Mao's concept of the continuity of the class struggle under socialist regimes in single countries.⁵³

Within the world system perspective there is a variant that has, in a number of sources, been referred to as dependency theory, with particular reference to the work of Dos Santos and Marini, among others.⁵⁴

Wallerstein, in referring to "world system" analysis, speaks of the approach on such a general level that at times it appears to be an

analytical catch-all for studying development. As the above quote illustrates, such a method of analysis has included works from liberal intellectuals (particularly in Latin America), to works developing out of the Cultural Revolution in China. Unlike the developmentalist theory, the point of departure of world system analysis assumes "that social action takes place in an entity within which there is an ongoing division of labour, and seeks to discover empirically whether such an entity is or is not unified politically or culturally, asking theoretically what are the consequences of the existence or non-existence of such a unity." ⁵⁵ The developmentalist point of departure, on the other hand, is that social action principally occurs in a "politico-cultural unit--the state, or nation or people--and seeks to explain differences between these units, including why their economies are different". ⁵⁶ Wallerstein further differentiates between what he terms "world-empires", that is, Rome, Ancient Greece, Ancient China, and the "world economy". The "world empire" is characterized as being politically unified, and a mode of production which he terms tributary, i.e., Asiatic mode or ancient slave mode. ⁵⁷ The "world-economy", on the other hand, is seen as characteristic of only the capitalist mode of production:

The 'world-economy' is a fundamentally different kind of social system from a 'world-empire' and a fortiori from a mini-system--both in formal structure and as a mode of production. As a formal structure, a world-economy is defined as a single division of labour within which are located multiple cultures--hence it is a world-system like the world-empire--but which has no overarching political structure to redistribute the appropriated surplus, the surplus can only be redistributed via the 'market', however frequently states located within the world-economy intervene to distort the market. Hence the mode of production is capitalist. ⁵⁸

The key to world system analysis as it relates to the development of a world economy is the structure of such a system as it relates to and modifies the various components, or "national-cultural units" within the system.

Within the world system approach there has developed a variant or sub-approach which has been termed dependency theory. While this classification appears to have been broadly used, there runs a common thread throughout such analyses which has been characterized by Frank as a chain of metropolises and hinterlands, essentially a series of centres and peripheries.⁵⁹ Development of the peripheral nations within this metropolis/hinterland framework was contingent upon links to the metropolitan nations.

Although the basic metropolis/hinterland approach was developed by Frank during the formative period of his analysis, inadequacies arising from such "bi-modal" conceptualizations become evident when one attempted to analyse supposed peripheral nations that displayed characteristics of economic expansion, and, conversely, developed nations that displayed certain characteristics of peripheral nations. A result has been a series of analyses in which concepts of "subimperialism", "favoured colony",⁶⁰ and a host of similar terms have been inserted into a Frankian framework. Such reformulations of the schema, however, appear not to have overcome a fundamental problem of dependency theory, in that it "has not moved beyond analysis of bilateral relations between units (i.e., nations), and hence has tended to conceptualize the world of nations as a static hierarchy⁶¹ which does not change, save for individual movements of nations". As a consequence, many of the analyses have been centred on the level of exchange relations, such as circulation of commodities, investment patterns

(flow of "fixed" and money capital), and the flow of surplus value (and profits) between geographical and national regions. Conversely, attention has been focussed away from the relations of production, which are at the root of such circulation and exchange.

While Andre Gunder Frank has drawn the lion's share of criticism from detractors of dependency theory, a substantial amount arises from misinterpretation by both critics and supporters of Frank's analysis, due in part to a certain amount of ambiguity in his own work. In order to clarify Frank's analysis, a discussion of his work is in order, particularly since attempts at a synthesis of staple theory with the Frankian analysis have been undertaken by Mel Watkins.

The work of Andre Gunder Frank, on the development of underdevelopment, is characterized by a number of hypotheses. While his work was undertaken with specific reference to Latin America, a number of general hypotheses may be drawn from it with respect to the theory of development of underdevelopment. First, "the now developed were never underdeveloped, though they may have been undeveloped"⁶². Further, the past or present of the underdeveloped countries in no way resembles the past of such developed countries and, therefore, development did not occur as a series of stages.⁶³ Second, "contemporary underdevelopment is in large part the historical product of the past and continuing economic and other relations between satellite underdeveloped and the now developed metropolitan countries".⁶⁴ Third, "the expansion of the capitalist system over the past centuries effectively and entirely penetrated even the apparently most isolated sectors of the underdeveloped world", and that the dualism that many observers see in underdeveloped countries is a product of capitalism; therefore,

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the dualist thesis must be rejected. Fourth, "these hinterland-satellite relations are not limited to the imperial or international level but penetrate and structure the very economic, political, and social life of"

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underdeveloped countries. Fifth, Frank held, therefore, that the development of satellites was limited by their dependent relationship to the metropole. When the ties to the metropole were weakened, satellites underwent greater growth; therefore, the most underdeveloped regions are the regions most closely linked to the metropolis.

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In Frank's analysis emphasis, therefore, falls on the development of a commercial monopoly as the means by which national and regional metropolises exploit the hinterland:

All of these hypotheses and studies suggest that the global extension and unity of the capitalist system, its monopoly structure and uneven development throughout its history, and the resulting persistence of commercial rather than industrial capitalism in the underdeveloped world (including its most industrially advanced countries) deserve much more attention in the study of economic development and cultural change than they have hitherto received.⁶⁸

It was in such a manner that Frank attempted to come to grips with the pattern of retarded economic development that was occurring in Latin America. By focussing attention on the fact that development/underdevelopment are linked, and take place within a world system which has become integrated by capitalist productive and exchange relations, Frank has outlined the structure associated with underdevelopment. Analyses of the class relations associated with the accumulation process within the world system has until lately, however, been generally lacking.

Studies on what may be termed "accumulation theory" starts from a somewhat different point of departure than dependency theory. The conditions under which capital accumulation takes place include: "(a) the

nature of the State; (and state policy); (b) class relations (the process of surplus extraction, intensity of exploitation, level of class struggle, concentration of work force)⁶⁹". Accumulation theory rests on the more concrete analysis of the relations between producers and non-producers within the capitalist "world-economy", regardless of the specific mode of such production, linking such relations of production within the periphery to the development of the capitalist mode of production in the metropolitan centres. It focusses on the internal class formations of the periphery, rather than the imbalances of trade and profits (circulation and exchanges) between the periphery and centre:

Unlike dependency studies which focuses on the growth of productive forces and how the external ties 'blocked' growth, the focus on conditions of accumulation and its impact on class relations allows us to focus more concretely on the nature of the state ultimately involved in both accumulation and class formation, as well as internal class relations as they emerge from, as well as shape capitalist development.⁷⁰

Of work done within the framework of "accumulation on a world scale" a large part has been done by Samir Amin. In doing so, Amin is carrying on from Frank and developing such an analysis on a higher plane. Unlike dependency theory, accumulation theory attempts to come to grips with the underlying class relations associated with the underdevelopment and exploitation of the periphery. Thus, while starting from a somewhat different point of departure than dependency theory, there is a similarity in the features of underdevelopment as recognized by Amin, such as "(1) unevenness of productivity as between sectors, (2) disarticulation of the economic system, and (3) domination from outside"⁷¹. This is in contrast to the "autocentric" developed metropole with its advanced economic development:

An advanced economy forms a coherent whole, made up of sectors that carry out substantial exchanges between themselves, what may be called "interindustrial" or "intersectoral" exchanges. Thus, these sectors appear complementary, solid with each other, so to speak: the extractive and power industries provide the basic industries with their chief raw materials, and these industries support, through the capital goods and semi-finished goods that they produce, light industries and modernized ("industrialized") agriculture, which, in their turn, provide the ultimate consumer goods.⁷²

Amin argues, therefore, that both development and underdevelopment can be understood only in relation to the international division of labour. Such a division, in turn, is associated with specific capitalist formations in both the periphery and the metropole. The nature of capital accumulation and exploitation within these specific formations will, in turn, also vary. Whereas in the centre it becomes a question of expanded reproduction, in the periphery, Amin argues, it is an analysis of primitive accumulation
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for the benefit of the centre. With capital accumulation occurring on a world scale, the contradictions of capitalism become contradictions on a world scale--"the contradiction is not between the bourgeoisie and the proletariat of each country considered in isolation, but between the
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world bourgeoisie and the world proletariat".

Amin is attempting, therefore, to account for the specific nature of class relations in the periphery in the development of a capitalist world-economy--in terms of a capitalist mode of production in the centre, and capitalism as a social formation throughout the world system--as part of the process of capital accumulation on a world scale. While he analyses the development of capitalist formations in the periphery, little discussion is addressed to the nature of the centre, except on a very general level, as is illustrated above. Rather, he depends on previous analyses (i.e., Lenin, Luxemburg, and Bukharin), building upon such work. A final

point about Amin's analysis is that he, like Frank, considers Canada, Australia, New Zealand, and South Africa to be part of the source of the problem; the white settler colonies constitute part of the centre, enjoying "autocentric" economic development. Such "autocentric" development involved the expansion of the capitalist mode of production within these specific national units; both within and across the various segments of the economic system. Within the "autocentric" nations there has and still is occurring a continual development and expansion of a proletariat at the expense of other modes of production (i.e., feudal, petty commodity, and so forth). At this point, discussion should shift to the "situation" of Canada (a settler colony) in the world system. In doing so, examination will begin with Amin's assessment.

In reference to the white settler colonies (including Canada) Amin refers to them as "young centers", viewing them as "exceptional formations that were constituted from the start in close connection with the genesis of European central capitalism".⁷⁵ Such countries are characterized as part of the centre due to the autocentric nature of their economies, with foreign investment playing a substantially different role than it does in the periphery:

The young capitalist countries on the road to independent development--in other words, autocentric and to a large extent autodynamic development--were able to receive substantial amounts of foreign capital. This flow nevertheless played, in their case, only an auxiliary role, secondary in quantitative terms, and also of diminishing importance. Thus, in the United States the proportion of foreign capital in the national wealth declined steadily from 10 percent in 1790 to 5 percent in 1850-1870, to fall to 1 percent in 1920 and disappear altogether thereafter, and the experience of Sweden, Canada, Germany, Japan, and Australia was similar. In these countries investment as a whole, foreign and local alike, induced a growth that was rapid because autocentric. Under these conditions, the problem of the flow of exported

profits became of secondary significance. These countries, having begun as borrowers, themselves became lenders, exporting capital in their turn, like the old metropolitan centers (Britain and France, later Germany).⁷⁶

Amin links such development to the growth of petty commodity production in what later would be the new centres, such production being, in the case of British North America, "a by-product of the proletarianization process in
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England". The immigrants to the settler colonies were of no direct interest to mercantilism, argues Amin, with the result that the mercantilists allowed them to organize themselves in an autocentric fashion for
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their own survival. In the case of Canada, Amin states:

The history of Canada was no different. Here also, from both the French and British standpoints, what was involved was not a periphery but a distinct by-product of social changes in Europe. When, by the Treaty of Paris of 1783, France preferred to retrieve Martinique rather than Canada, which she had lost twenty years earlier, Voltaire declared the choice to be an intelligent one: 30,000 Negro slaves were worth more to French mercantilism than a few "thousands of acres of snow" inhabited by poor devils who had nothing to export.⁷⁹

The present "situation" of Canada within the world system, which Amin argues is part of the centre, is, therefore, viewed as a product of simple commodity production rooted in the process of the proletarianization in Britain. Such a mode of production provided the nucleus or embryonic form for a development of a capitalist mode of production. Amin's position, therefore, runs counter to a number of theories of Canadian development, which emphasizes an argument that dependency constitutes the relationship of Canada to the dominant metropolitan nations, comparing Canada to a number of Latin American nations.

While the petty commodity producers may have served as the embryonic basis for capitalist development, the question still exists as to

the development of a proletariat in the new or "young centers". Capitalist production implies the opposite side of the coin--two complementary, yet simultaneously conflicting classes--as capitalist production is dependent on a proletariat, as well as a capitalist, class. This, then, brings us to the final point of discussion surrounding the "location" of Canada--as well as other white settler colonies--within the world-system: the "problem" of the formation of a proletariat and the process of "primitive accumulation" within a social formation in which petty commodity production is prevalent. While Amin hints at a direction to follow by linking such a development to the "process of proletarianization in England", because of the emphasis of his work on the periphery, he does not develop his analysis in such a direction.

The development of an analysis in this manner, however, had, to some extent, been done by Marx in his discussion on the work of Edward Gibbon Wakefield, and the theory of colonization. As Marx illustrates, in the colonies, in order for the capitalist mode of production to develop, there had to occur a process of primitive accumulation. ⁸⁰ The question of the "location" of Canada within the world system is, therefore, linked to the earlier discussion on the problem of transition and petty commodity production; what remains is the question of the formation of a proletariat--the process of proletarianization in Canada. While much has been written on labour history in North America, what seems to be lacking, at least until rather late, is work on the formation of a proletariat in North America. This appears to be the case particularly with Canada, where most of the writing on working class history has been union and organization history.

The process of the formation of a proletariat in North America, unlike Europe, did not involve the "freeing" of peasant labour from their feudal bonds. Rather, in North America labour had to be torn from the means of production, which was in their ownership and possession:

The great beauty of capitalist production consists in this-- that it not only constantly reproduces the wage-worker as wage-worker, but produces always, in proportion to the accumulation of capital, a relative surplus-population of wage-workers. Thus the law of supply and demand of labour is kept in the right rut, the oscillation of wages is penned within limits satisfactory to capitalist exploitation, and lastly, the social dependence of the labourer on the capitalist, that indispensable requisite, is secured But in the colony this pretty fancy is torn asunder. The absolute population here increases much more quickly than in the mother-country, because many labourers enter this world as ready-made adults, and yet the labour-market is always understocked. The law of the supply and demand of labour falls to pieces. On the one hand, the old world constantly throws in capital, thirsting after exploitation and "abstinence"; on the other, the regular reproduction of the wage-labourer as wage-labourer comes into collision with impediments the most impertinent and in part invincible The wage-worker of today is to-morrow an independent peasant, or artisan, working for himself This constant transformation of the wage-labourers into independent producers, who work for themselves instead of for capital, and enrich themselves instead of the capitalist gentry, reacts in its turn very perversely on the conditions of the labour-market. Not only does the degree of exploitation of the wage-labourer remain indecently low. The wage-labourer loses into the bargain, along with the relation of dependence, also the sentiment of dependence on the abstemious capitalist.⁸¹

Marx further points out that capital's solution to the problem was rather concisely set down by Wakefield through a policy of "systematic colonization", so as to artificially manufacture a supply of wage-workers in the colonies, just as systems of protection "manufacture capitalists artificially in the mother-country".⁸²

Wakefield, in devising the scheme, saw three reasons for the necessity of colonization on the part of the mother-country: (1) extension of

markets, (2) enlargement of the field for employing capital, and (3) relief⁸³
from excessive numbers (in the labour market of the mother-country).

Similarly, the colony needed the influx of both population and capital⁸⁴
in order to develop the "unlimited" potential wealth of the colony.

As illustrated by Marx, however, Wakefield faced the problem of having to
"kill two birds with one stone". The first and second ends of colonization
required the entry of the colonizers into the market in order for these
ends to be realized. On the one hand, entry as a buyer of commodities,
and on the other, entry as a seller of the commodity labour-power. In
order to have to do so, the labourer would have to be separated from the
means of production. Wakefield saw the retention of lands by the crown,
or their lavishing on aristocrats and capitalists by Government, as no solu-
tion to the problem. While it prevented the development of self-sufficient
producers, it also served to choke immigration into the colony as the price⁸⁵
of land would be too exorbitant for most settlers and capitalists alike.

"Systematic colonization" would be the solution to the problem. This method
involved the making of the acquisition of land prohibitive enough so as
to compel the immigrant to work for wages for a period of time, with
proceeds from the sale of land and from taxes being used to bring in more
immigrants to replace the labourer settling on the land:

How, then, to heal the anti-capitalistic cancer of the
colonies? If men were willing, at a blow, to turn all the
soil from public into private property, they would destroy
certainly the root of the evil, but also--the colonies.
The trick is how to kill two birds with one stone. Let
the Government put upon the virgin soil an artificial price,
independent of the law of supply and demand, a price that
compels the immigrant to work a long time for wages before
he can earn enough money to buy land, and turn himself into
an independent peasant. The fund resulting from the sale
of land at a price relatively prohibitory for the wage-
workers, this fund of money extorted from the wages of

labour by violation of the sacred law of supply and demand, the Government is to employ, on the other hand, in proportion as it grows, to import have-nothings from Europe into the colonies, and thus keep the wage-labour market full for capitalists This is the great secret of "systematic colonisation". By this plan, Wakefield cries in triumph, "the supply of labour must be constant and regular, because, first, as no labourer would be able to procure land until he had worked for money, all immigrant labourers, working for a time for wages and in combination, would produce capital for the employment of more labourers; secondly, because every labourer who left off working for wages and became a landowner, would, by purchasing land, provide a fund for bringing fresh labour to the colony.⁸⁶

It was through such a method, argues Marx, "that the English Government for years practised this method of 'primitive accumulation', prescribed⁸⁷ by Mr. Wakefield expressly for use in the colonies". Marx further adds such a policy ended up being subverted through the diversion of emigration to the United States rather than the colonies, as there existed enough land to draw settlers. It is argued by Marx, however, that such emigration could not be handled by the United States:

On the one hand, the enormous and ceaseless stream of men, year after year driven upon America, leaves behind a stationary sediment in the east of the United States, the wave of immigration from Europe throwing men on the labour-market there more rapidly than the wage of emigration westwards can wash them away. On the other hand, the American Civil War brought in its train a colossal national debt, and, with it, pressure of taxes, the rise of the vilest financial aristocracy, the squandering of a huge part of the public land on speculative companies for the exploitation of railways, mines, &c., in brief, the most rapid centralisation of capital. The great republic has, therefore, ceased to be the promised land for emigrant labourers.⁸⁸

British emigration was being diverted into the labour-market of the United States, resulting in the failure of Wakefield's colonization scheme. Rather than the formation of a capitalist labour-market and the growth of capital in the colonies, the United States was enjoying such expansion.

It would only be at a later date that a similar process on a relatively large scale would occur in Canada.

This process of the formation of a labour-market in Canada has been described by a few Canadian writers. H.C. Pentland deals with the systematic colonization policies of Wakefield in relation to the development of a "capitalist labour market" within Canada. In doing so, Pentland emphasizes the development and decline of petty producers in association with the development of a working class, particularly with respect to the entrance of immigrants intent on becoming farm proprietors.⁸⁹ Similarly, Stanley Ryerson discusses the formation of a "work-force of propertyless wage-labourers", particularly through immigration. In his examination, however, Ryerson emphasizes the impediments to the development of petty commodity producers, rather than the development of such producers.⁹⁰

Unlike colonies in which the mode of production is, or was, of a feudal or tributary nature, Amin is essentially correct in arguing that the colonies in which petty commodity production was prevalent (the white settler colonies) developed autocentrically and, therefore, constitute part of the centre of the capitalist world system. Such a mode provided the basis for the "primitive accumulation" by serving as an embryonic form of capital, and secondly, with its destruction, providing the labour required for the development of capitalist productive relations. The development of capitalism in such nations occurred in a systematically different fashion to the process of its development in Western Europe. While the settler colonies were at various points in time dependent on Britain (and to a lesser degree Europe), such colonies also served a somewhat different role, as earlier illustrated through Wakefield's work.

Summary

The intention of this chapter has been to serve as an introduction to the theoretical framework, by which an analysis of the development of Canada will be undertaken, and with mining serving as the concrete illustration of this theoretical framework. In doing so, two basic concepts were introduced: (1) mode of production, and (2) the process of capital accumulation on a world scale.

Discussion on modes of production proceeded from a general, somewhat abstract, definition to the more concrete level of specific modes of production (in this case, the feudal and capitalist modes). Such an examination, by comparing a number of usages of the concept, has attempted to outline a common ground among various definitions so that the basis for further analysis could be developed. As a result, it was decided to deal with the concept of mode of production specifically in terms of the economic foundations--the relations of production (property relations and relations of appropriation) and the material forces of production (labour process and technology). Based on such a conceptualization, the feudal mode of production, it was argued, parallels serfdom, with surplus being transferred from producers to non-producers in the form of either rent in kind or money, or direct labour, under "direct politico-legal compulsion". In the capitalist mode of production labour becomes a commodity--an object of exchange. In this change the labour process, as well, was transferred, with the responsibility for it passing to the non-producer. As such, within the capitalist mode of production the labour process has become dominated by the accumulation of capital.

Further, with respect to the previous concepts, it was pointed out that such concepts should not be viewed in an ideal-typical fashion. Rather, there exists a dynamic arising from the developing yet conflicting social relations of production associated with each specific mode; that while transitions occur between modes, such transitions did not occur simultaneously in all structures of a social formation.

Associated with such a question of transition, discussion then focussed on the specific transition between feudalism and capitalism. In the ensuing examination it was pointed out that, generally, attempts to come to grips with this problem of transition have involved the development of the concept of the petty commodity mode of production in various forms. The nature and appearance of such a mode seems to vary dependent on the particular historical circumstances in which it developed, that is, as illustrated through its conceptualization by O'Connor with respect to the United States, as compared to Dobb et al. with respect to Europe. It was finally decided that the treatment of such a mode would be to view the petty mode as constituting the embryonic form of capitalism, a necessary part of the process of primitive accumulation (especially in the white colonial settler regions).

Discussion at this point shifted to the second major concept, capital accumulation on a world scale. It was illustrated that recent analyses of the development of capitalism on an international basis could generally be categorized as being either of a developmentalist nature or of a "world-system" (or "structuralist") nature. The discussion of the developmentalist approach surrounded its primary straw-man, W.W. Rostow.

With respect to the "world-system" approach, it was illustrated that this perspective arose in response to the inadequacies of the developmentalist approach. The point of departure of this approach is, as its name implies, the entity of the world. This is unlike the developmentalist approach, which deals with politico-cultural units (i.e., the state or nation) as generally isolated units of analysis.

Discussion on the "world-system" approach continued by illustrating that within this framework there existed two variants: (1) dependency theory, and (2) accumulation theory. Dependency theory, it was argued, has been characterized by analyses which place emphasis on the hinterland/metropolis relationship associated with economic development and underdevelopment. Further, in doing so, most of the attention was also directed away from the relations of production; consequently, exchange relations between nations served as the focus of attention.

Unlike dependency theory, accumulation theory, it was argued, rested upon the more concrete analysis of the relations between producers and non-producers within the capitalist "world-economy", linking the relations of production within the periphery (regardless of the mode) to the development of the capitalist mode of production in the metropolitan centres. Such an analysis, therefore, focusses on the internal class formations of the periphery. The concept of hinterland/metropolis takes on a new meaning within the accumulation theory framework. Whereas with dependency theory the "location" of any national unit within the "world-system" was determined on the basis of exchange balances; within the accumulation perspective it becomes a question of the nature of the class structure, whether there occurred a continual expansion of the capitalist mode of

production and of capitalist productive relations (whether a nation was "autocentric" or "disarticulated").

While the main proponents of the two variants of "world-system" theory have not directly analysed the nature of the centre, it was illustrated that they (A.G. Frank and Samir Amin) considered Canada to be part of the centre or metropolis. Since accumulation theory is based on a more concrete level in terms of class relations, discussion, therefore, shifted to the treatment of Canada and other "white settler colonies" by Amin. It was illustrated that Amin viewed such nations as "young centers", because of the autocentric nature of their economies. This, in turn, was linked by Amin to the development of petty commodity production in such regions. Petty commodity production was seen as serving as the basis for primitive accumulation. It was argued, however, that such accumulation also required the separation of the petty commodity producer from the means of production, a process which Marx illustrates, occurred through systematic colonization, since petty commodity production would not inherently transform itself into capitalist production.

In analysing mining, it is intended to demonstrate that its development reflected this process of the development of capitalism in Canada. The development of mining will be viewed as reflecting the struggle between the petty commodity mode of production and the development of the capitalist mode of production within Canada.

The balance of the thesis will consist of three core chapters. Chapter II will discuss, as indicated previously, a predominant analysis of economic development within Canada, known as "staple theory". Chapter III will be somewhat descriptive, dealing with the particular nature of

relations within mining in both feudal and capitalist modes of production, particularly in Britain. The purpose of such a description will be to highlight the particular nature of mining labour as it develops into a proletariat, and the nature of the struggles associated with such a transformation. The fourth chapter will deal specifically with the development of mining in Canada. It is in this section that the transition from petty commodity production to a capitalist mode of production within mining in Canada will be discussed. A final chapter will serve as a conclusion, discussing the implications and limitations of the analysis, and giving possible future directions.

NOTES TO CHAPTER I

1. The term lumber should not be confused with the square timber trade which was beginning to decline as the period under study commenced. Rather, lumber refers to the production of saw-logs and planks, involving different techniques of production; the use of water and/or steam driven saw mills at or relatively near to the site of harvesting.
2. Examples of such work is that of Martin Robin and O.W. Main. The work of Martin Robin on British Columbia centres on mining as it related to the development of that particular region. See: Martin Robin, The Rush for Spoils: The Company Province, 1871-1933. (Toronto, 1972). O.W. Main's work on the Canadian nickel industry concentrates on the development of monopoly and market control in the production of nickel, particularly outlining the growth of the International Nickel Co., Ltd. The study deals with only one mining area (Sudbury) from its beginning (1880-1881), mentioning other nickel mining areas only to the extent that they affect the conditions of monopoly and market control. A passing reference is made to the early attempts and developments near Georgian Bay and on Lake Superior in the opening chapter. See: O.W. Main, The Canadian Nickel Industry: A Study in Market Control and Public Policy. (Toronto, 1955).
3. M.H. Watkins, "A Staple Theory of Economic Growth", in Approaches to Canadian Economic History. (Toronto, 1967), pp. 53-54.
4. Innis' treatise on mining, as mentioned of most works, followed the trend of studying mining from the Klondyke period onwards. See: H.A. Innis, "Settlement and the Mining Frontier", in W.A. Mackintosh and W.L.G. Joerg (eds.), Canadian Frontiers of Settlement, Vol. IX. (Toronto, 1936).
5. K. Marx, Grundrisse. (Trans. by Martin Nicolaus). (London, 1974), p. 100.
Marx, in this passage, is referring to the method of abstraction of bourgeois political economy, and correspondingly, the materialist method of abstraction. Classical economists, he maintains, placed a great deal of emphasis on land and rent, as it only seemed natural to do. As Marx argues, however, such a beginning was erroneous, since "there is one specific kind of production which predominates over the rest". This dominance, in turn, will modify other forms of production. Even Adam Smith was viewed as encountering this problem and falling "back into the Physiocratic system". As Marx states:

Nothing seems more natural than to begin with ground rent, with landed property, since this is bound up with the earth, the source of all production and of

all being, and with the first form of production of all more or less settled societies--agriculture. But nothing would be more erroneous. In all forms of society there is one specific kind of production which predominates over the rest, whose relations thus assign rank and influence to the others. It is a general illumination which bathes all the other colours and modifies their particularity. It is a particular ether which determines the specific gravity of every being which has materialized within it In bourgeois society it is the opposite. Agriculture more and more becomes merely a branch of industry, and is entirely dominated by capital. Ground rent likewise Capital is the all-dominating economic power of bourgeois society. It must form the starting-point as well as the finishing-point, and must be dealt with before landed property It would therefore be unfeasible and wrong to let the economic categories follow one another in the same sequence as that in which they were historically decisive. Their sequence is determined, rather, by their relation to one another in modern bourgeois society, which is precisely the opposite of that which seems to be their natural order or which corresponds to historical development. The point is not the historic position of the economic relations in the succession of different forms of society. Even less is it their sequence 'in the idea' (Proudhon) (a muddy notion of historic movement). Rather, their order within modern bourgeois society.

Ibid., pp. 106-108. Also see: P. Sweezy, The Theory of Capitalist Development. (New York, 1968), pp. 11-22.

Similarly, with respect to the Mercantilists, Marx argues that they, unlike the Physiocrats, and other classical economists, posited value as arising "from simple circulation-money; (the Monetary System) therefore made this abstract form of wealth into the exclusive object (Objekt) of nations which were just then entering into the period in which the gaining of wealth as such appeared as the aim of society itself". A later variation upon this theme which he termed the Mercantile System, was seen as involving "faint notions of money as capital".

(The Mercantilists) already have faint notions of money as capital, but actually only in the form of money, of the circulation of mercantile capital, of capital which transforms itself into money. Industrial capital has value for them, even the highest value--as a means, not as wealth itself in its productive process--because it creates mercantile capital and the latter, via circulation, becomes money.

Capital and wage-labour were, therefore, viewed as sources of wealth only to the extent that they produced money.

Marx, Grundrisse, pp. 327-328.

Martin Nicolaus, in a footnote, points out that while Marx made such a distinction in this section, he normally linked them together under the title Monetary System. See: Grundrisse, pg. 103n.

In a certain fashion, staple theory appears to follow Mercantilism (or the Monetary System) in the analysis developed. Staple theory places primary emphasis on the circulation of commodities, raw materials (staples) and manufactured goods within the colonial network (later the imperialist network). Development therefore hinged on the ability of the nation to partake in such circulation. While this theme (the relationship between mercantilist theory and staple theory) will not be developed here, it is hoped that in future work it can be expanded upon.

6. K. Marx & F. Engels, The German Ideology. (New York, 1947), p. 42.
7. Marx & Engels, Ibid., pp. 42-47.
8. K. Marx, A Contribution to the Critique of Political Economy. (New York, 1970), pp. 20-21.
9. Marx, Ibid., p. 21.
10. See: K. Marx, Grundrisse, pp. 85-88, and pp. 100-108; also K. Marx, Capital, Vol. I, Afterword to Second German Edition, p. 17-20.
11. Maurice Dobb, Studies in the Development of Capitalism. (New York, 1947), p. 7.
12. Dobb, Ibid., p. 7.
13. Geoffrey Kay, Development and Underdevelopment: A Marxist Analysis. (New York, 1975), p. 22.
14. Kay, Ibid., p. 23.
15. Kay, Ibid., p. 23.
16. Nicos Poulantzas, Political Power and Social Class. (London, 1975), p. 13.
17. Poulantzas, Ibid., pp. 14-15.
18. Poulantzas, Ibid., pp. 15-16.

19. Poulantzas, Ibid., p. 25.
 20. Poulantzas, Ibid., p. 26.
 21. Poulantzas, Ibid., pp. 26, and pp. 29-32.
 22. As mentioned earlier, Poulantzas' work has been the centre of much debate, particularly amongst certain circles of Marxists. Much of it surrounds his theoretical constructs and conceptualization. Included in this is his conceptualization of the "political" as well as the capitalist mode of production. For an overview discussion, see: Ernesto Laclau, "The Specificity of the Political: 'The Poulantzas--Miliband Debate'", Economy and Society, Vol. 4 (1975), pp. 87-110.
- As stated earlier, however, it is not my intention to enter into the intellectual "donnybrook" surrounding the work of Poulantzas.
23. Dobb, Op. cit., pp. 35-36.
 24. Rodney Hilton, "Introduction", The Transition from Feudalism to Capitalism. (London, 1976), p. 30.
 25. Poulantzas, Op. cit., pp. 28-30.
- Poulantzas saw the feudal mode of production as being non-homologous.
26. Maurice Dobb, "Reply to Sweezy, (I)", in R. Hilton (ed.), The Transition from Feudalism to Capitalism. (London, 1976), pp. 57-58.
 27. Maurice Dobb, "From Feudalism to Capitalism", in R. Hilton (ed.), Ibid., p. 165.
 28. Dobb, Studies in the Development of Capitalism, p. 7 and 16.
 29. Harry Braverman, Labor and Monopoly Capital/the Degradation of Work in the Twentieth Century. (New York, 1974), pp. 52-57.
 30. Braverman, Ibid., p. 52.
 31. Braverman, Ibid., p. 53.
 32. Braverman, Ibid., pp. 70-75.

Such a manufacturing division of labour serves capital in more than one way. Not only does it reduce the cost of labour by increasing production absolutely, but, as Braverman illustrates, in dividing the labour process up into its "constituent elements" it increases the control over the process by capital, and in turn, further cheapens labour by replacing skilled labour with "semi-skilled" or unskilled labour. (Braverman, pp. 79-82)

Every step in the labor process is divorced, so far as possible, from special knowledge and training and reduced to simple labor. Meanwhile, the relatively few persons for whom special knowledge and training are reserved are freed so far as possible from the obligations of simple labor. In this way, a structure is given to all labor processes that at its extremes polarizes those whose time is infinitely valuable and those whose time is worth almost nothing. This might even be called the general law of the capitalist division of labor. (Braverman, pp. 82-83)

33. This debate surrounding Dobb's Studies in the Development of Capitalism, is contained in the work edited by Rodney Hilton, The Transition from Feudalism to Capitalism. (London, 1976)

34. This question is implicit in the work of Andre Gunder Frank, Geoffrey Kay, and Marvin Sternberg, among others.

In particular, Kay and Sternberg address such regional disjunction in the development of particular modes of production. See: Andre Gunder Frank, Latin America: Underdevelopment or Revolution. (New York, 1969)

Geoffrey Kay, Development and Underdevelopment: A Marxist Analysis. (New York, 1975)

Marvin Sternberg, "Dependency, Imperialism, and the Relations of Production", Latin American Perspectives. Vol. I, No. 1 (Spring 1974)

35. Nicos Poulantzas, "On Social Classes", New Left Review. No. 78 (March-April 1973), p. 33.

36. Poulantzas, "Ibid.", pp. 32-33.

37. James O'Connor, "Review: The Twisted Dream", by Douglas F. Dowd, Monthly Review. Vol. 26, No. 10 (March 1975), pp. 49-50.

Such development of independent producers not only occurred in agriculture and artisan crafts, but, O'Connor notes, also developed among the miners of Wisconsin, where mining labor "was more (Cornish) independent commodity producing labor than wage labor. (O'Connor, p. 50)

38. Leo Johnson, "The Development of Class in Canada in the Twentieth Century", in G. Teeple (ed.), Capitalism and the National Question in Canada. (Toronto, 1972), p. 145.

39. Johnson, "Ibid.", pp. 145-153.

40. Samir Amin, in speaking of the exceptional nature of the predominance of simple commodity production in the "white settler" colonies, relates it to the decline of feudalism in Europe:

Predominance of the simple commodity mode of production is even more exceptional. We find it only in New England between 1600 and 1750, in the South Africa of the Boers between 1600 and 1880, and in Australia and New Zealand from the beginning of white settlement to the rise of modern capitalism. These societies of small farmers and free craftsmen, where the simple commodity mode of production was not tacked on to tribute-paying or slave-owning modes but constituted the principal mode of social organization, would be inexplicable if one did not know that they were the by-product of the breakup of feudal relations in England (and, secondarily, in the Netherlands and France). The poor people proletarianized by this breakup emigrated, and the ideal model that they established in the new lands where they settled gave expression to this exceptional background. Such formations have a strong tendency to develop into full-fledged capitalist formations.

Samir Amin, Unequal Development. (New York, 1976), p. 21.

While Amin and O'Connor do not concur on dates, they agree as to the existence of simple commodity mode of production. Its existence in North America may have been beyond 1750, however, still as a by-product, and dominated by European (mainly British) capital, for while the United States (after 1775) was politically separate from Britain, it was not isolated on the economic level.

41. Dobb, "From Feudalism to Capitalism", in Hilton (ed.), Op. cit., pp. 167-168.

Dobb appears to reject the notion that the petty mode was anything more than a transitory form between feudalism and capitalism which never attained ascendancy. Rather, the feudal elements maintained superiority until the respective bourgeois revolutions (political revolutions) in Western Europe, i.e., 1640 in Britain; 1789 in France. Until that period the state was under the control of the feudal elements.

See: Dobb, "A Reply to Sweezy, (I)", in Hilton (ed.), Ibid., pp. 61-64.

42. Karl Marx, Capital. Volume I, pp. 761-762. The debate surrounding the transition from feudalism to capitalism appears to be associated with particular interpretations of certain sections of Capital, Volumes I and III, dealing with primitive accumulation, the role of mercantile capital, and ground rent.

- See: Marx, Capital. Volume I, Part VIII, and Volume III, Part IV, and Chapter XLVII.
43. Marx, Capital. Volume I, pp. 765-774.
 44. Guiliano Procacci, "A Survey of the Debate", in Hilton (ed.), Op. cit., p. 135.
 45. Procacci, "Ibid.", p. 136.
 46. Dobb, "From Feudalism to Capitalism", in Hilton (ed.), Op. cit., p. 167.
 47. Dobb, Studies in the Development of Capitalism, pp. 242-250. Also see: Sidney Pollard, The Genesis of Modern Management. (Cambridge, Mass., 1975), pp. 61-75.
 48. The term "world system" perspective has been coined by Immanuel Wallerstein. See: Immanuel Wallerstein, "The Present State of the Debate on World Inequality", in World Inequality. (Montreal, 1976), p. 16.
 49. Geoffrey Kay, Op. cit., pp. 8-9.
 50. Wallerstein, "Op. cit.", p. 16.
 51. While Rostow's work has been the more prominent, it is not the only major work in this field. In a critique of the developmentalist traditions, Andre Gunder Frank speaks of three modes or trends within the approach. First is what has been termed the "ideal typical index approach", which includes both Rostow's stages of growth model, and the work of Bert Hoselitz, who applied the "pattern variables" of Talcott Parson's Social System to the study of economic development. The second approach has been identified as the "diffusionist approach", and perceives development as a process of acculturation of values, knowledge, skill, technology, and capital to the poor nations. The final mode has been coined the "psychological" approach. See: Andre Gunder Frank, "Sociology of Development and Underdevelopment of Sociology", Latin America: Underdevelopment or Revolution. (New York, 1969), pp. 21-94.
 52. Frank, "Ibid.", p. 45.
 53. Wallerstein, "Op. cit.", pp. 15-16.
 54. While the exact source of the term dependency theory is unknown to the author, among sources which discuss this approach are: Augustin Cueva, "A Summary of Problems and Perspectives of Dependency Theory", Latin American Perspectives, Vol. III, No. 4 (Fall, 1976); Ronald Chilcote, "Dependency Theory: A Critical Synthesis of the Literature", Latin American Perspectives, Vol. I, No. 1 (Spring, 1974).

55. Immanuel Wallerstein, "A World-System Perspective in the Social Sciences", British Journal of Sociology. Vol. 27, No. 3 (September 1976), p. 345.
56. Wallerstein, "Ibid.", p. 345.
57. Wallerstein, "Ibid.", pp. 346-348.
58. Wallerstein, "Ibid.", p. 348.
59. Andre Gunder Frank, "The Development of Underdevelopment", in Latin America: Underdevelopment or Revolution. (New York, 1969), pp. 14-24.
60. Ruy Mauro Marini, "Brazilian Subimperialism", Monthly Review. Vol. 23, No. 1 (February 1972), pp. 14-24.
61. Harriet Friedman and Jack Wayne, "Functionalism and Dependency: Replacing Old Orthodoxies with New", Paper presented at the VIIIth World Congress of Sociology, Toronto (August 1974).
62. Frank, "The Development of Underdevelopment", p. 4.
63. Frank, "Ibid.", p. 4.
64. Frank, "Ibid.", p. 4.
65. Frank, "Ibid.", pp. 4-5. It is in response to the dualist theory that Frank placed emphasis on the penetrability of the capitalist system into the underdeveloped world, and resulting in less emphasis on the class relations than on the actual relationship of dependency between the periphery and the metropole.
66. Frank, "Ibid.", p. 6.
67. Frank, "Ibid.", pp. 9-13. Frank, in reply to the dualist thesis, maintains that the development of the latifundia in Latin America can be viewed as a response to the growing demands of the world capitalist system, both in terms of the national and international market. See: Frank, "Ibid.", pp. 14-15.
68. Frank, "Ibid.", p. 15.
69. James Petras, "New Perspectives on Imperialism and Social Classes in the Periphery", Journal of Contemporary Asia. Vol. 5 (1975), p. 292.
70. Petras, "Ibid.", p. 293.
71. Samir Amin, Accumulation on a World Scale (New York, 1974), p. 15.

72. Amin, Ibid., p. 16.
73. Amin, Ibid., pp. 20-22.
74. Amin, Ibid., p. 24. The concepts of world bourgeoisie and world proletariat as developed by Amin does not correspond to what traditionally is meant by bourgeoisie and proletariat. Amin, in reference to the world bourgeoisie, is referring to the bourgeoisie at the centre as the "leading nucleus", or "the essential driving force", along with the bourgeoisie in the periphery which has formed in the wake of the bourgeoisie of the centre. The "peripheral bourgeoisie" is a dependent bourgeoisie founded in the context of the world market and "dominated by the center".
The world proletariat is viewed in somewhat of a complex manner. While the nature of the proletariat in the centre is viewed as being homogeneous--there exists a coincidence between the capitalist mode of production and the social formation in the centre--in the periphery the nature of the proletariat is seen by Amin as taking on a variety of forms. (Amin, pp. 25-26)

(The proletariat) is not made up solely or even mainly of the wage-workers in large scale modern enterprises. Also forming part of it are the masses of peasants who are integrated into world exchange and who on that account pay, like the working class of the towns, the price of the unequal exchange that is reflected in the difference between rates of surplus value at the center and in the periphery. Although various forms of social organization (often "precapitalist" in aspect) form the framework in which these peasant masses exist, they are ultimately proletarianized through their integration into the world market. (Amin, pp. 25-26)
75. Amin, Unequal Development, p. 57.
76. Amin, Ibid., p. 249.
77. Amin, Ibid., p. 365.
78. Amin, Ibid., pp. 365-369.
79. Amin, Ibid., p. 366.
80. Marx, Capital, Volume I, Chapter XXXIII, pp. 765-774.
81. Marx, Capital, Volume I, p. 769.
82. Marx, Ibid., p. 766.

83. Edward Gibbon Wakefield; The Collected Works of Edward Gibbon Wakefield (ed.), M.F. Lloyd Prichard (London, 1968), pp. 504-520. Also see: H.P. Pappe, "Wakefield and Marx", Economic History Review, Second Series. Vol. IV, #1 (1951), pp. 91-92.
84. Wakefield, Op. cit., pp. 520-521.
85. Wakefield, Ibid., pp. 550-551.
86. Marx, Capital, Volume I, p. 772.
87. Marx, Ibid., p. 773.
88. Marx, Ibid., p. 773.

One of the main points Marx was illustrating in this chapter is that bourgeois political-economy made its self-discovery in the colonies, where it found one of its innermost secrets.

The only thing that interests us is the secret discovered in the new world by the political economy of the old world, and proclaimed on the house-tops: that the capitalist mode of production and accumulation, and therefore capitalist private property, have for their fundamental condition the annihilation of self-earned private property; in other words, the expropriation of the labourer. (Marx, Capital Volume I, p. 774)

89. H.C. Pentland, "The Development of a Capitalistic Labour Market in Canada", Canadian Journal of Economics and Political Science. Vol. XXV, No. 4 (November 1959), pp. 458-461.
90. Stanley Ryerson, Unequal Union (Toronto, 1968), pp. 178-182.

CHAPTER II

THE STAPLE APPROACH: A HOME-SPUN "THEORY" OF DEPENDENCY AND DEVELOPMENT

In this chapter the emphasis will be on illustrating and discussing certain "traditional" theories generally included under the rubric of the "staple thesis", an approach that has risen to a dominant position in Canadian political economy. The "staple approach", which encompasses a variety of analyses, involves a set of common assumptions in which staple exports (primary commodities) are seen as the leading sector or motor of the economy, and, therefore, setting the pace for economic growth. Within the staple paradigm, economic development involves a process of diversification around an export base, and this, in turn, affects the structure of the staple producing society. Such an approach, however, involves a number of theoretical shortcomings, since economic development is seen as being directly related to international systems of trade; the dynamic is set at the level of circulation rather than at the level of production. Whereas the previous chapter set out the theoretical framework in order to deal with the shortcomings of the staple approach, in this section the ensuing discussion will be on certain representative works of the staple approach to illustrate the various analyses within it, particularly as it relates to the development of mining within Canada. Discussion will involve the "classical staple theories" of Harold Innis and W.A. Mackintosh, as theories of economic dependency and growth, and the works of historian, Donald Creighton. Following an examination of "classical staple theory"

will be a discussion of selected analyses which have been built upon foundations consisting of the works of Innis and Creighton. Such analyses can be classified in terms of their emphasis. On the one hand, a relatively large volume of work has emerged, stressing the hinterland/metropolis aspect of staple theory. This work has generally been modified by influences of similar analysts outside of Canada, such as the works of Andre Gunder Frank.¹ Discussion of such work will centre on the writings of Mel Watkins. Secondly, and based somewhat upon the work of the Laurentian school, there are treatises which centre on the development of a mercantile capitalist class in Canada. The writings of R.T. Naylor will become the focus of attention. Naylor's work has focussed generally on the capitalist class in Canada since the Conquest. Little, if any, mention is made about the growth of a proletariat in Canada by any of these traditions.²

The "Classical Staple Theories" of Innis, Mackintosh, and Creighton

The substantial contribution of Canadian economic historians, and others, to the study of Canadian economic history is the staples approach. Indeed, it is Canada's most, if not only, distinctive contribution to political economy, and the occasion of the formal recognition of the existence of the latter by the Canadian Political Science Association is an appropriate time to re-examine the staples approach.³

With such opening remarks, a leading proponent of the "staple theory" described the theory's impact on the analysis of economic development in Canada at a recent gathering of academics. While "staple theories" have occupied a prominent position in Canadian political economic analysis, to term it a theory appears somewhat misleading. Rather, a more correct term might be the "staples approach", referring to the approach in terms of its central focus. The reason for viewing staples in such terms

becomes clear when, in reviewing the literature, one encounters a number of theories, some conflicting, in which the prime driving force of Canadian development is said to be the production of staples for export.⁴ This variety of analyses found in works that have generally been termed "staples theory" has further been complicated by the "growth of cultural domination from the U.S.", in which the approach has been integrated with theories developed in the context of the development of the United States, as Drache⁵ illustrates.

The initial development of "staple theories" has generally been attributed to the works of Harold A. Innis and W.A. Mackintosh. While these men may have shared a similar emphasis, the resulting perspectives tended to be radically different. The inclusion of Donald Creighton, whose work followed closely that of Innis, was decided on as a result of Creighton's focus on the growth of the mercantilist class and the role of the state involved with the staple trade. Discussion will, therefore, be initiated with the work of Mackintosh.

W.A. Mackintosh: Staple Trade as an Impetus to Development

Following the example of the American experience, as set out in the "frontier" hypothesis of F.J. Turner, and the works of G.S. Callender, Mackintosh constructed a similar model of development for Canada, which⁶ viewed staple production and export as the keys to economic growth. His writings displayed a unique optimism that has hardly been matched, even during the supposed industrial boom years of the late 1950s and early 1960s. The optimism Mackintosh expressed over Canadian economic development "stemmed from his assessment that through a process of incremented growth, Canada had left behind its colonial heritage". Such optimism had given

Mackintosh the confidence to feel that Canada was coming of age and "that it was only a matter of time before Canada's industrial revolution would be complete".⁷ For Mackintosh, wheat was a commodity that would "prime the pump of Canadian industry".⁸

Mackintosh had developed, basically, a stage model of growth in which staple exports provided the basis for an internal market. Such a market grew through settlement associated with staple production and the expansion of a transportation infrastructure. Industrial development followed suit in order to supply the expanding domestic market, and in turn might lead to the growth of an export market for manufactured products.⁹ Prior to such development transpiring, Mackintosh argues, certain factors essential for the transition from a pioneer economy and the growth of industrialism had to be fulfilled.

The primary factor that was viewed crucial by Mackintosh was the possession of a staple which could be disposed of in the markets of advanced nations. As he states:

Only by means of (staples) can the pioneer economy acquire the products of the specialized industries of mature communities. Failing it the pioneer community must live like the Swiss Family Robinson who had neither export staples nor capital imports, but only virgin resources and mature techniques carried in the incredible mind of the elder Robinson. Without an export staple or the prospect of one no capital import is possible except such as may be brought immigrants.¹⁰

The importance of the possession of a marketable staple was illustrated in his reference to the development of New England and the Middle Colonies of Britain in comparison with that of New France. The British colonies, particularly the southern colonies, possessed numerous staples, such as tobacco, indigo, cotton and other products which were

in demand and which encouraged settlement. In New France the fur trade had developed at approximately the same time. The nature of the staple was,¹¹ however, seen as not unfavourable to settlement. For Mackintosh it was wheat which provided the key initial factor, particularly in the late nineteenth century, although other staples such as minerals and the fledgling pulp and paper industry would stimulate expansion as well.

But the driving force behind the new period was wheat and the wheat growing region. It gave an economic unity to the country not hitherto experienced and built up a degree of interdependence between its different regions which was in sharp contrast to the isolation of the separate economic regions which united in 1867.¹²

Before the staple could be moved and settlement undertaken, a second factor, the building of a transportation infrastructure, had to be satisfied. The problem of inadequate transportation facilities has been seen by Mackintosh as continually confronting the settlement of Canada. In contrast to the United States, where westward expansion was relatively easy once the barrier of the Appalachians was overcome, Canada's westward expansion from the Great Lakes region was halted by the Laurentian Shield. Continued westward settlement was dependent upon the building of the Canadian Pacific Railway which breached "the Laurentian barrier between the Great Lakes and the prairies". Such prairie settlement was seen as the ultimate salvation¹³ and justification of the railway.

Prior to overcoming the problem of the Laurentian Shield, immigration into Canada tended to flow into the U.S. Midwest. Canadian emigration was seen by Mackintosh as serving to help fill in the American North-West, which acted as the Canadian frontier in the early post-Confederation period. During that period the vitality of Canada was being drained through

emigration resulting from geographic barriers thwarting the advancement of
¹⁴
 the Canadian frontier.

While the railways overcame the geographic handicap that Mackintosh saw as confronting the economic development of Canada, the final factor that any expansion was influenced by was an adequate price for the staple. This factor is generally external to the staple producing country, and, as a result, the pioneer staple producer is seen as dependent on fluctua-
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 tions of the international market. Once these factors were favourably combined the stage for expansion of the pioneer economy was set, such as
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 occurred with the sudden westward expansion on the prairies. Mackintosh views such expansion of a nature basically similar to what Watkins has
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 described as involving the "spread effects of the export sector". This spread effect "can be broken down into three linkage effects: backward
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 linkage, forward linkage, and what we shall call final demand linkage". Backward linkage involves the impetus for investment "in the home-production
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 of inputs, including capital, for the export sector". It includes not only the immediate fixed capital associated with the production of a staple commodity, but also "the building of transport systems for collection of
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 the staple". Forward linkage involves an impetus to "invest in industries
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 which use the output of the export industry as an input". It is, basically, a vertical integration of the productive processes associated with the export commodity, encompassing an increase of the value added of export staples within the home economy. Final demand linkage involves the investment "in domestic industries producing consumer goods for the export sector. Its prime determinant is the size of the domestic market, which is, in turn, dependent upon the level of income--aggregate and average--

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and its distribution". By using the example of Western expansion connected with the building of railways and the development of a wheat economy on the prairies, Mackintosh illustrated the linkage effect associated with staple production. The process of pioneer staple growth is summarized by Mackintosh:

With the emergence of an export staple, there was set up that familiar circular flow which is the life-blood of the pioneer economy,--merchandise exports, capital imports, merchandise import balances, a high rate of investment, full employment in spite of heavy immigration, profit inflation, and rising property values With such a product (staple commodity) it can purchase the goods which are desired but which it cannot produce. Out of the proceeds of sale it can accumulate capital. The prospect of profits from the continuing sale of such a product is an inducement to the entry of fresh streams of capital into the pioneer community. Only by this means can the pioneer community pass from the pseudo-prosperity of the settlement boom to the genuine prosperity of a fully functioning economy.²³

As the preceding quote further illustrates, Mackintosh was aware that certain difficulties which confronted the development of Canada were external influences. He never addressed an important problem, however, which confronted pioneer economies; the "leakage" to foreign factors, particularly the remittance in the form of dividends, interest, management fees, etc., to foreign capital involved in the production of staples. Watkins describes leakage as embracing two aspects:

But a portion of the income may be received by what Levin has called 'foreign factors'--factors which remit their income abroad--rather than 'domestic factors'. To the extent that income received by foreign factors is not taxed away domestically, final demand linkage will be lessened. The servicing of capital imports is a case in point. Primary producers are notoriously susceptible to indebtedness, and the burden will be greater the more capital intensive the staple. Leakage can result from wages paid to migratory labour and from immigrants' remittances.²⁴

It appears implicit in Mackintosh's work that capital would begin to accumulate in the pioneer economy due to staple production. This capital would belong to entrepreneurs within the pioneer nation. As later findings indicate, however, such "leakage" to foreign factors was considerable, including in the staple sectors (particularly mining, pulp and paper, and oil).²⁵ Further, even in cases of petty commodity production such as farmers and fishermen, such producers were tied into the system of staple (or primary) export circulation through British portfolio investment, particularly associated with railway construction. Mackintosh certainly did not account for the international structure of the capitalist markets associated with staple production. As Innis would later indicate, the international structure would be a very important force molding any form of industrialization in Canada.

H.A. Innis: Staple Production in an Imperial Context

Whereas Mackintosh views staple production as the key to economic growth, Harold Innis views Canada as remaining a net exporter of resources, and importer of manufactured goods, resulting from the nature of the "imperial" relationship Canada was in. As Drache states:

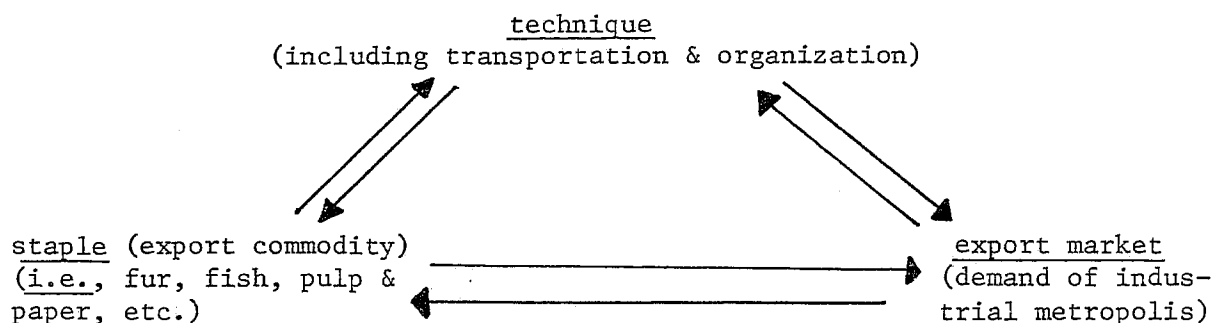
Innis conversely (to Mackintosh) held the view that Canada's staple accented economy would remain fundamentally a dependent one because centre-margin relations under capitalism are such that dependencies are prevented from developing into self-generating industrialized economies.²⁶

Again, unlike Mackintosh, Innis reveals a much wider scope to his analysis. Not only does Innis concentrate on the economic development of Canada in terms of staple trade, but he also focusses on the technique, organization of and institutions associated with such trade. One realizes the

importance Innis attached to the effect of staple production, for he held that each staple, in its turn, leaves its mark on Canada society. In the trade associated with a given staple, not only were resources being exported and imported, but also sets of relations which, in turn, affected the structure of society.²⁷

Innis never spelled out directly the staple thesis he used, but throughout his works he wove a theory in which the concept of cyclonics²⁸ was all-important. Basically, Innis' thesis states that Canada has had a history of being a resource hinterland for various metropolitan centres; first France, then Great Britain, and lastly the United States. His three major early works, The Fur Trade in Canada (1930), Settlement and the Mining Frontier (1936), and The Cod Fisheries (1940) deal with the export of certain staples, although not in successive order, to industrialized metropolises. In these works, Innis emphasizes the inter-relationship between three key factors of the dependent relationship between the staple producing nation and the metropolitan centre: (1) character of the staple, (2) technique of exploitation (including transportation and organization), and (3) the demand for the staple in an industrialized centre, as illustrated in Figure I below.

FIGURE I. Innis' Concept of Cyclonics



The concept of cyclonics referred to the effect of the application of modern technology to regions of untapped resources, resulting in rapid growth and development, which had taken European societies centuries to accomplish. "Stages of growth . . . were telescoped,--and growth was so sudden that it could only be compared in unpredictability and intensity to the onset of a cyclone".²⁹ Each staple was seen as having a certain technique, including organization and transportation structures, as well as definite institutional structures surrounding the staple producing sector. A change in technique was seen as affected changes in the production of the staple, both directly and indirectly through an influence on demand in the export market (i.e., price dropping and/or quality of finished product improving, and developing new products, thereby inducing new demand for the staple). Such changes in demand, in turn, could lead to further pressure for developing the techniques of staple exploitation. The change and expansion associated with new staples then resulted in changes in the structure of the staple producing society. Such a conceptualization of cyclonics is evident in the following:

The economic history of Canada has been dominated by the discrepancy between the centre and the margin of western civilization. Energy has been directed toward the exploitation of staple products and the tendency has been cumulative. The raw material supplied to the mother country stimulated manufactures of the finished product and also of the products which were in demand in the colony. Large-scale production of raw materials were encouraged by improvement of technique of production, of marketing, and of transport as well as by improvement in the manufacture of finished product. As a consequence, energy in the colony was drawn into production of the staple commodity both directly and indirectly.³⁰

Innis argues that placer mining in the Pacific regions of North America, and in Australia and New Zealand not only led to a rapid increase in

population in these regions, but also in the expansion of railways (i.e., the Union Pacific, and the Canadian Pacific), and, more importantly, on patterns of liquidity preference.³¹ Innis saw in the transfer of staple production to products such as gold as leading to industrial development in formerly untapped regions, such as the Yukon and especially the Kootenays; particularly with the switch from placer to lode mining operations. This cyclonic effect of development around the production of staples, starting with the fur trade, was seen by Innis as having serious consequences for Canada.

In his work on the fur trade, Innis undertook a detailed study of the development of the fur trade as involving forces that tended to "favour the formation of Canada into a distinct, unified, political entity".³²

The political boundaries of Canada were determined by the fur trade.

Canada emerged as a political entity with boundaries largely determined by the fur trade. These boundaries included a vast north temperate land area extending from the Atlantic to the Pacific and dominated by the Canadian Shield. The present Dominion emerged not in spite of geography but because of it. The significance of the fur trade consisted in its determination of the geographic framework. Later economic developments in Canada were profoundly influenced by this background.³³

Canadian political unity was seen, therefore, as growing out of the continuous interaction of technology, geography, and institutions associated with the growth of the fur trade.³⁴

From the inception of the trade, its growth was seen as dependent on the development of transportation to facilitate the trade, the availability and quality of the beaver pelts, and the development of technology, both in terms of its effect on the manufacture of fur products, and of the growth of manufactured goods with which to trade for pelts. The organiza-

tion of the enterprise, and, in turn, the political structure, reflected the demands of its trade. As the trade expanded under the French regime because of the demand for furs in France, the transportation of furs over ever-increasing distances "involved the elaboration of an extensive organization of transport, of personnel, and of food supply".³⁵ Coupled with this, the expansion of the trade network brought an increase in the amount of inferior grade of pelts, necessitating the expansion of trade north west in search of superior grade of pelts (particularly castor gras), resulting in a tendency towards monopolization of the industry and increased direct involvement of the French government. It was, however, predominantly monopolization at the points of trade: Montreal, Quebec, Fort Frontenac, Michilimackinac and other key posts, while trade with various isolated bands of Indians were allowed to continue in the hands of the individual³⁶ trader.

While expansion of the trade occurred under the French regime, within such expansion Innis noted that there existed the roots of destruction of New France. The expansion of the trade led to very disastrous changes in the lives of the Indian people as they became increasingly³⁷ dependent on European goods. This, in turn, put pressure on European manufacturers to increase supplies, a position in which the British were³⁸ at a decided competitive advantage. The institutions of the fur trade were inadequate for meeting such a challenge, as the trade became more expensive because, partly, there was increased involvement of the military,³⁹ which resulted in increased "drains on the resources of the home government".

In the post-Conquest period, Innis argued that the English merchants had to come to grips with the "technical demands of the trade, resulting

in an organization of the trade that was essentially similar to the "centralized on monopolistic control in the external trade and the reliance on individual traders in the interior", as was characteristic of the French regime.⁴⁰

The technical demands of the trade were of fundamental importance. The vastness of the country tributary to the St. Lawrence drainage basin, as it has been covered by the French, made inevitable the adoption of French methods of conducting the trade. The merchants from Albany accustomed to carrying on the trade within the relatively narrow limits prior to the end of the war were faced with vastly different conditions.⁴¹

This was particularly true in the case of the North-West Company. In time the company had built up an organization stretching from the Atlantic to the Pacific. In being adapted to such expansion, however, Innis foresaw the seeds of its destruction as the availability of new territory declined, resulting in increased competitiveness among the wintering partners or individual traders. The company eventually amalgamated with the Hudson Bay Company in 1821, which Innis attributed the adaptability of the Hudson's Bay Company's organization to changing conditions of trade.⁴² While the Northwest Company had failed, it was, as Berger states, a qualified failure, for the "far-reaching area of control it had established was retained by the Hudson's Bay Company".⁴³ It was that same area of control, Innis notes, that largely became the boundaries of the Dominion--a theme developed to a much further extent by Creighton.⁴⁴

It is within the framework of the declining fur trade that Innis placed the growth of the lumber trade. While he never wrote a treatise on the trade, he notes this connection in the conclusion of The Fur Trade in Canada:

The decline of the fur trade in eastern Canada which followed the export of furs from the North-west through Hudson Bay after 1821 necessitated increased dependence on other staple exports. Wheat and potash had become increasingly important but they were overshadowed by the rise of the lumber trade. The transport organization and personnel of the fur trade and its capitalistic beginnings were shifted to the development of new lines of trade On this basis with the advantages of preference in England and abundant and cheap shipping after the war, the lumber exports to Great Britain increased rapidly in the face of Baltic competition.⁴⁵

The effect of this transition was drastic for the structures associated with the fur trade since the unused capacity of returning timber ships was used to carry immigrants, resulting in radical alterations of the social structure in both Canada and Europe.⁴⁶ Innis saw such immigration as leading to agricultural development, and later wheat production as a staple commodity, resulting in the development of a new transportation infrastructure with the building of canals, and later railways. The impetus to the construction of the new transportation facilities was seen as having serious consequences for the political structure of Canada, in that the need for capital for the building of the canals resulted in the Act of Union of 1841, while the expansion of railways was associated with the Act of Confederation of 1867.⁴⁷

While the expansion of agricultural staples may have been an impetus to the development of railways, Innis viewed a similar relationship with respect to minerals. In his treatise on the mining industry, Settlement and the Mining Frontier, Innis focusses increased attention on the relationship between staples and the expansion of transportation systems, along with the possible diversity and disunity surrounding the exploitation of the "new staples" such as minerals. As such, this was somewhat of a departure from The Fur Trade in Canada, in which Innis places a great

deal of emphasis on the character of the staple itself. Further, of his major early works, Settlement and the Mining Frontier is possibly where his use of the concept of cyclonics is the clearest.

In his Settlement and the Mining Frontier, Innis sets out to demonstrate "the effects of mining on railways and on the Canadian economy generally, and to suggest determining factors including overhead costs,⁴⁸ hydro-power, technology, and the character of the ore bodies". In demonstrating these effects, Innis discusses the development of mining in the Klondike, Kootenays, and Northern Ontario in relation to the expansion of railways, emphasizing the varying impact of the relationship in the different regions. For each of these regions, Innis argues, mining served as an impetus, or at least added to any pressures toward railway construction, and, in turn, such construction paved the way for changes in the nature of the mining industry. This was particularly emphasized in relation to the development of the Klondike goldfields, and the Kootenay region,⁴⁹ in relation to the construction of the White Pass and Yukon Railway,⁵⁰ and the Crowsnest Pass route of the Canadian Pacific. The construction of the T.N.O. (Temiskaming and Northern Ontario), and later the Hudson Bay Railway, was viewed as being an impetus to mining development, but that the initial construction of the railway was not in response to the requirements of such development.

Railways built across formations suitable for the development of mining have been built for the development of agriculture. Metal mining in Northern Ontario owes its expansion to construction of railways to open up agricultural territory. The Sudbury area was discovered with construction of the Canadian Pacific Railway to Western Canada, and Cobalt with the construction of the Temiskaming and Northern Ontario Railway to the clay belt of Northern Ontario. The work of the surveying and construction gangs

provided an intensive prospecting and a large-scale trenching of new country. At Cobalt and at Sudbury, blacksmiths were concerned with the discovery of metal. Mining developments began directly as a result of railway construction.⁵¹

While the Hudson Bay Railway was not built in order to open new agricultural territory, but rather to facilitate the export of products from existing agriculture areas, Innis attributed the same effects on mining to the railway's construction. The Hudson Bay line was viewed as facilitating the expansion of mining development in Northern Manitoba.⁵²

Although Innis spoke directly about the relationship between railways (and transportation generally) and mining in relation to the reduction of overhead costs associated with both types of operations, he focussed a good deal of attention on the effects for subsidiary development in the respective regions. It is this attention to such effects that characterized his concept of cyclonics. Innis described such effects as being radically different in the Klondike in comparison to the Kootenays and Northern Ontario. The penetration of the railway into the Yukon resulted naturally in a decline of overhead cost for mining both through cheaper transportation for goods previously brought in over pack trails from Skagway and by facilitating the introduction of labour-saving machinery. The resultant change in technique was viewed by Innis as resulting in a relative decline of Dawson, well in evidence by 1911; a decline resulting not only from a replacement of labour with machinery, but the new operations led toward a monopolization of production and the direct dealing between the mines and supply sources outside the Yukon for equipment needs. The position of the Yukon merchant and equipment supplier became rather
⁵³
tenuous. Because of the climatic restraint and geographic isolation

of the Yukon, this relative decline of the gold rush was viewed by Innis as being impossible to alleviate through the development of agriculture or the development of lumbering operations, both of which could at best supplement the needs of the Klondike for such goods. With the exception of the fur trade, the Yukon would continue to slip as the technique of gold mining changed.⁵⁴

The development of mining in both the Kootenays and Northern Ontario, Innis viewed, resulted in much different consequences for development around such a base than could have occurred in the Klondike. The expansion of the railways again was viewed as having a critical impact on the growth of mining in these regions, although there existed base metal mines and lode mining of precious metals in both regions; both of which did not occur in the Klondike. Such mining required different techniques to the placer mining of the Klondike region. While the character of these operations was different, the impact of railway expansion was basically similar in that it reduced the overhead costs of mining operations and facilitated the importation of machinery to the mining regions. In the Kootenays, this occurred with the building and expansion of the Trail smelter, and the development of the Crowsnest Pass coal mines along with the construction of acid and powder works to supply the mines.⁵⁵ While Innis notes that the expansion of mining in Northern Ontario, with the possible exception of Sudbury and Noranda Quebec, did not have what might be termed the spread effect that the expansion of mining had in the Kootenays, both regions had formed the basis for industrial expansion.*

*The inclusion of Noranda, Quebec in discussion on mining expansion in Northern Ontario seems the only normal thing to do since its development grew out of the development of Cobalt, Porcupine, and Kirkland Lake. Geological features have no respect for man-made boundaries.

Innis notes this fact with respect to the development of hydro-electric development, built initially to supply the "lode" mines' heavy power equipment and available for other uses on the exhaustion of such mines.

On exhaustion, mines contribute permanent equipment such as hydro-electric power plants which provide support for new and varied industries.⁵⁶

The construction of railways in Northern Ontario, and especially the Kootenays, in Innis' view, had a dramatic effect on subsidiary developments. Whereas in the Klondike the construction of a railway subverted such subsidiary development, the effect on agriculture and lumbering in the Kootenays and Northern Ontario was seen as more positive. The growth of agriculture in the valleys of British Columbia (Okanagan, Thompson, Kootenay, and Columbia River Valley) in relation to mining, was given an added impetus with the opening of the prairie market through the construction of the Crowsnest Pass route.⁵⁷ Similarly, Innis noted that pockets of agriculture developed in parts of the Pre-Cambrian Shield in response to the demands of the nearby mining regions. While he viewed such endeavours as not having the potential of agriculture in British Columbia, it was, nevertheless, thought that the agriculture in Northern Ontario⁵⁸ was viable enough to survive the exhaustion of the mining industry.

In both regions (Kootenays and Northern Ontario) Innis noted the development of lumbering in response to mining. It took the form of supplier of specialty lumber products and Innis gave no indication of possible transition because of decline of any local demand with respect to lumbering in Northern Ontario.⁵⁹ In the Kootenays he cited evidence of the development of lumbering for export purposes.⁶⁰

Basically, Innis' treatise on mining dealt with the effect of transportation on mining development, focussing on the growth of technique

in transportation facilitating the expansion and replacement of existing technique in the mining industry, and subsequent effects on subsidiary development. While Innis may have stressed the importance of technique, he also viewed the "new staples" such as minerals, and pulp and paper, as leading to a more stable economy associated with industrialism.

In industry, in finance, and in railway traffic, mining largely implies a more-rounded, better-balanced economy and introduces additional types of development, which in the main reduce evils of dependence on a staple commodity. The industry promotes a highly-integrated advanced type of industrial community.⁶¹

Such developments were viewed as leading to an expansion of manufactures around the mining industry, where "subordinate industries followed the demands of the mining industry" resulting in a "trend toward advanced stages of manufacture". Innis holds that such diversification of markets brought increasing stability, thereby accentuating "integration within
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Canada".

Although Innis noted that a possibility existed for expansion around a base such as mining, he does not develop the optimism that was generally characteristic of Mackintosh's analysis. Innis still maintains that such industrialism and expansion was a dependent process because Canada and all staple economies were a resource hinterland. This was particularly attributed to the relative weakness of Canada in relation to the United States in terms of technology and investment "capital", along
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with dependence on the American market.

In summary, then, Innis' theory on staple production can be characterized as having placed emphasis on the character of the staple, including the relationship to geographic factors, technique of exploitation, and the demand for the product (price system). This emphasis on

technique and geographic factors has resulted in certain shortcomings in Innis' analysis of Canadian development, since he failed to analyze the social divisions and class conflict associated with the production of staples. Daniel Drache points out that the reason for such shortcomings was "that Innis made the basic error of confusing the factors of production with the forces of production. The economics of technology was brought to the centre stage. The economics of class and class conflict remained in the background of his analysis"⁶⁴. This confusion by Innis is evident in his handling of capital, labour, and the state. Labour and capital are treated as part of technique (or forces of production). This is evident in his work on mining, in which labour is seen as an overhead cost of production along with "capital" as exemplified by fixed "capital" or machinery.⁶⁵ Further, as Ryerson notes, similar problems arose with the handling of capitalism.

In the course of his exhaustive economic researches--which constituted a vital contribution to the study of Canada's development--Innis only in rare instances mentioned capitalism. The emergence of Canada as a modern state is inevitably a part of the spread of industrialism and capitalism, he wrote in his Problems of Staple Production. But it is no more than passing reference; and it is seemingly equated with industrialism or (at times) with what is referred to simply as an 'international economy'. The implications of capitalism as an evolving socio-economic formation are not worked through by Innis, or, in all likelihood grasped.⁶⁶

This is noticeable in the following statement by Innis:

Placer gold acted as the most powerful conceivable force in mobilizing labour and capital for an attack on the difficult Pacific Coast region. It capitalized in most direct fashions the strength of the pecuniary motive. It had at its command the most efficient means of exacting the resources of a money economy based largely on gold. With the expansion of the base, in the development of a variety of industries, with the increasing efficiency of the price

mechanism, and with the continued improvement of industrialism, especially in relation to transportation, expansion with each succeeding gold rush became more rapid.⁶⁷

When discussing the "state", Innis viewed it in a typically "third party" sense in relation to the production of staples. Although he displayed an awareness of the effectiveness of government action in the growth of capital, such as literally bankrolling the construction of the Canadian Pacific Railway through devices such as guaranteeing the interest on railway bond issues, cash subsidies, and land grants, Innis tended to view the relationship between the government and capital as being between two separate but interdependent interests. The state (government) was viewed as being a separate entity in control of "formulating political policy" and under the influence, or effected by "veiled interests which are vocal in policies".⁶⁸ His view of the state as a third and usually benevolent force can be linked to the fact that Innis had not descended to the evolving "socio-political relationships" involved with the production of staples⁶⁹ in a capitalist "socio-economic formation".

Innis's work, in centering on technique, did not probe into the changing relationships of property and class, and the distribution of social formations when different modes of production come into contact with each other, such as occurred with the development of the fur trade. This "problem" with Innis's work would continue into his later work on communications and his analysis of the rise of monopolies, as Stanley Ryerson demonstrated:

For Innis' critique of monopoly to be effective, and capable of further development, it would have been necessary for him to probe the socio-economic roots of monopoly, to examine the real context of property and class relationships in the given 'culture'. But he turned away from questions of social structure.⁷⁰

Such shortcomings have important implications for any attempt to develop an analysis arising from a synthesis of staple theory and Marxian class analyses, such as exemplified in the works of Watkins (to be discussed later).

Donald G. Creighton: "Pax Canadiana", and the Growth of a Canadian Commercial Class on the St. Lawrence

Parallelling the work of Innis, and essentially building on the foundations which Innis laid (particularly with reference to the fur trade), Donald Creighton focussed on the growth of a mercantilist or commercial class associated with such staple trade. Within Creighton's work, generally referred to as the Laurentian thesis, a great deal of emphasis is placed on the St. Lawrence River as being the only real access to the interior of the continent from the Eastern seaboard; inspiring whomever possesses the river with a "Pax Canadiana" or "Manifest Destiny of the North".

This Laurentian theme has its basis in the fact that the St. Lawrence is the one great river system that leads from the Atlantic Seaboard to the heart of the continent of North America. Its owners, the Canadians, have held in it a unique possession; and the realization of its potentialities has been one of the most persistent and compelling aims of their existence as a people. The river has inspired generations of Canadians to build a great territorial empire, both commercial and political, in the western interior of the continent. The prime feature of this imperial drive is therefore western expansion--expansion across the continent to the Pacific Ocean.⁷³

This theme is particularly spelled out in Creighton's early work, The Commercial Empire of the St. Lawrence, 1760-1850. In his later works, Creighton, while not abandoning this theme, places emphasis on other aspects of the commercial class, such as in the two volume biographical works on Sir John A. MacDonald. It is in The Commercial Empire of the St. Lawrence

that Creighton appears to be nearest to the staple thesis, and, therefore, discussion will centre on his early writings. Even in this work, however, staples were placed in a passive context, unlike their position in the works of Innis. The central theme of Creighton's work, particularly with respect to The Commercial Empire of the St. Lawrence, is the "creative" role of the commercial capitalist class--a creativity involving the destruction of the absolutist state (feudal mode of production) in Canada, and the building of a commercial empire and market based on the "natural" opportunity afforded them by the geography of North America. Along with the commercial class and the state, the geographical factor occupied a central part of Creighton's analysis. Other factors such as staples, labour, transportation, etc., occupied a secondary position within his framework.

Creighton placed a great deal of emphasis on the geographical features of North America, including, but not only, the St. Lawrence. Geography appeared to determine the nature of the developing economy and society, or, as Berger metaphorically states, it was the stage on which the North American drama occurred.⁷⁴ Creighton argues that the conflicts between the British and French regimes "were rooted in the continent", in the clash between the economy of the St. Lawrence and rival economies; for while the quarrel may have been an "extension of the political rivalries of Europe", there also existed a "prime contradiction in North America which made the conflict "a product of North America".⁷⁵

As a "stage" for such a North American "drama", Creighton viewed the North American continent as encompassing a "natural" geographical base of an economic empire centered on the St. Lawrence and any political division of North America was "unnatural". Creighton maintained such an

argument with respect to both the Treaty of Paris (1783) and the Constitutional Act (1791), for the year 1783 resulted "in the establishment of an international boundary where none had existed before--a boundary devoid of geographical and historical meaning which cut through the commercial empire of the St. Lawrence".⁷⁶ The Constitutional Act of 1791 was seen by Creighton as complementing the blunder made in 1783, by repartitioning the St. Lawrence economy and effectively isolating Montreal and its merchants from the trade to the west, while nullifying "the vigour and initiative of Upper Canada by the lethargy of the lower province".⁷⁷

While Creighton realized a certain natural pull to the St. Lawrence, which had been severely crippled by political decisions made by British and American diplomats, he also noted that the river had a fatal flaw. "It was like a great, healthy, powerful organism spoilt by an incongruous weakness."⁷⁸ Its course was broken by falls and rapids at Niagara, Cascades, the Cedars, and Lachine. The divide between the St. Lawrence, and the Hudson Valley to the south, the Mississippi to the south-west, and Hudson Bay to the north was "low and facile", such that "invasions (economic as well as military) might pass as easily as sorties".⁷⁹

Such flaws were viewed by Creighton as being handicaps or constraints to attempts by a commercial class to forge an empire based on the river. These geographical constraints required the development of a transportation infrastructure on the part of the commercial class; a development in which Creighton saw control of the state as playing an important role.

It was in relation to such a "natural empire" and its geographical constraints that Creighton dealt with the second major aspect of the work, the growth and "creativity" of a commercial class bent on the exploitation

of such an empire. This investigation was a history of the developing Canadian commercial class from their standpoint. Beginning with the Conquest in 1760, Creighton spelled out the history of Canada through this group as involving the attempted development of an interior empire built initially on the fur trade inherited from the French regime. In focussing on the commercial class, Creighton emphasized its development in relation to the growth and change in the trade of staples, and the conflicts that arose between this class and other classes. This conflict between the commercial class and other classes was viewed as changing in relation to transitions in staple production, that is, with the French Canadian bureaucracy and aristocracy, then later agrarian interests in Upper Canada (petty commodity producers). Secondly, conflict arose between the Canadian commercial class and the commercial class in the United States, such that the "natural" east-west metropolitan market pull associated with the staple trade centered on the St. Lawrence was in near continuous conflict with the north-south pull arising from the Hudson-Mohawk route in the United States. "His stress", as Berger points out, "was on the interplay between politics and commerce, on the clash of interest groups and the political alignments of such groups." ⁸⁰ Throughout Creighton's work this interplay is noted by the conflicts over the control of the state and political apparatus since the Conquest in 1760, in order to further their respective interests. The outcome of the clashes between the commercial interests and other groups was viewed as having serious implications for the so-called "natural empire" which the commercial class were in possession of. Such implications were made evident by the transitions in the staple trade, particularly associated with the transition from the first commercial empire to the second commercial empire.

With the Conquest of Canada by the British in 1760, there occurred an immigration into Canada of a class of merchants from the Thirteen Colonies and Britain, generally associated with supplying the needs of the British military forces. This group of merchants soon became involved with the staple trade as "the northern commercial system began to recruit⁸¹ its new management". They inherited the fur trading empire of the French and, in turn, became Creighton's commercial class. He viewed the conflicts in which the commercial class was involved as arising out of the needs of the system built upon the "natural empire".

The merchants became a political power because they controlled and represented a commercial system of enormous potentialities; and it was the commercial system which, in turn, dictated their main political demands.⁸²

In the "first commercial empire", associated with the fur trade, the commercial class was viewed as being in conflict with the French bureaucracy, and the British military aristocracy over the needs of the commercial system, as well as in conflict with the Atlantic seaboard and⁸³ Hudson Bay over control of the inland empire. Such conflict centered around the need to maintain the "natural empire" of the St. Lawrence, and the freedom of trade within such an empire, as such needs met head-on with the interests of the British military in maintaining security over the Indian territory, and with the French Canadian "professional" groups over the juridical system left over from the French regime, in particular the⁸⁴ commercial and bankruptcy laws that hampered the furtherance of trade. Beyond the conflict with the French Canadians over certain aspects of the old French law, Creighton notes that the commercial class adapted well to existing French fur trading structure. It appeared that the major source

of grievance was placed on British imperialists and mercantilists' interests as they developed through the actions of the British military interests in Canada, along with political and mercantilist developments in Britain.⁸⁵

It was in the outcome of the political struggle that Creighton saw forces leading to a transition in the economic activities of the commercial class. With the Treaty of 1783, the commercial class lost the battle to maintain the "natural empire" of the St. Lawrence. The fur trade shifted increasingly to the North-West and into the Pacific region as the division of the St. Lawrence empire lead towards the closure of the Mississippi region to the Montreal fur trade interests; a closure resulting as much from the patterns of agrarian settlement in the Ohio and Mississippi Valleys as from political decisions reached in the United States. Coupled with the changes in the Mississippi region there occurred an influx of settlers (Loyalists) to the Great Lakes Region of Canada and the Eastern Townships completing the push of the fur trade away from the Lower Great Lakes.⁸⁶

As a result, the fur trade was increasingly carried on over ever-increasing distances; a situation which led to the inability of the Montreal fur trading interests (i.e., the North-West Company) to compete with the Hudson Bay Company, and eventually leading to their amalgamation in 1821.⁸⁷

Throughout the period from 1783 to 1821, Creighton notes that the activities of the commercial class underwent a transition in response to these forces, a transition, however, which was accompanied by attempts at countering the political forces that appeared to hamper the commercial activities of the merchant.⁸⁸

In the transition to the new staples, Creighton saw the basis of what might be termed the second commercial empire; an empire based on the

staples of timber and agriculture (particularly wheat). Even with the shift in staple trade by the commercial class, however, Creighton notes that the old political conflicts continued to exist, that is, the division of the commercial empire within British North America, the existence of the French legal system, and the conflicts of imperial, mercantile, and industrial interests in the British parliament, all of which hampered the growth of the interests of the Montreal-based commercial class. The conflict with the French Canadian bureaucracy and aristocracy was seen by Creighton as expanding to include the "peasants"; and all facets of French Canadian culture. No longer were the differences just over French commercial and bankruptcy laws, but they expanded into conflict over land tenure, taxation, land settlement, and agricultural production in general. Such conflict over taxation, particularly as it affected the financing of canal construction, was not only with the French Canadians but also developed with the agrarian interests in Upper Canada. Creighton noted, however, that a second generally less direct, but more ominous, conflict--a conflict in which the Montreal commercial interests were but a minority participant--existed. It was the developing conflict between the mercantile and industrial capital in Great Britain surrounding the repeal of the Corn Law in 1847. Compounding this blow was the action of the United States government in removing import tariffs on agricultural goods passing from Canada through New York. It was such external conflicts and actions that were viewed by Creighton as having dealt the death blow to the second commercial empire.

In summary, then, Creighton, more so than Innis and Mackintosh, deals directly with "one" of the classes involved with the production of

staples. His emphasis was not so much on the nature or qualities of the staples produced, but rather centered on the mercantilist involved with the trade of such commodities. Creighton's work may be best described as an analysis of a class rather than a "class analysis"--the study of class relationships, class structures, and the dynamic associated with class conflict as it pertains to specific relations of production. In Creighton, class conflict appears synonymous with interest group conflict, for it is not conflict at the level of productive relations, but rather quarrels with groups generally having similar interests, that is, American (Eastern seaboard) mercantilists, and British colonial officials. The quarrels with other "classes" were of a particular nature, rather than over the fundamental structure of society, for example, with the French over their commercial and bankruptcy laws, and with the British colonial authorities over the maintenance of such laws, as well as British colonial and diplomatic policy vis a vis the United States. It is only with regard to the French Canadians and, to some extent, the native people, particularly with the decline of the fur trade and the ascendancy of agriculture, that the conflict appears to involve more fundamental aspects of the structure of the society. The conflict appears, at least in Creighton's portrayal, to involve the basic conflict between a dying feudalism and a developing mercantilism. Such a conflict was, however, as much a conflict between land or rentier bourgeoisie and a mercantile bourgeoisie.

While Creighton dealt with the mercantilist or commercial class in Canada, the emphasis placed on geographic factors tends to give Creighton's work an air of geographic determinism. Unlike Innis, who saw geographic factors as being constraints which were to be overcome by the

application of technology in transportation systems, Creighton tended to place a greater emphasis on the permanence of the geographic factors. For Creighton, the improvement of transportation was seen as a means of improving the "natural route of the St. Lawrence"; a route which was viewed as the great unifying force having an almost spiritual hold on whomever had possession of the empire:

The dream of the commercial empire of the St. Lawrence runs like an obsession through the whole of Canadian history; and men followed each other through life, planning and toiling to achieve it. The river was not only a great actuality it was the central truth of a religion. Men lived by it, at once consoled and inspired by its promises, its whispered suggestions, and its shouted commands; and it was a force in history, not merely because of its accomplishments, but because of its shining, ever-receding possibilities.⁹⁴

This emphasis on geography overshadowed and replaced class struggle as the dynamic, for the conflicts of the commercial class are viewed as rooted in the imperatives of the river rather than in the material interests of classes and class fractions developing in Canada and Great Britain.

Building on Innis and Creighton: Mel Watkins, Tom Naylor, and the Application of Dependency Theory to Canada

While the analysts being considered in this section do not, by any means, represent all the trends growing out of the work of Innis and Creighton, their consideration is necessary in light of the direction of their work. Both Naylor and Watkins have attempted to bridge the gap between staple theory and Marxist theory. The writings of Naylor, following closely those of Creighton, analyse the development of a capitalist class in Canada, stressing that it remained essentially a mercantile or commercial class, and, in turn, had a retarding or destructive effect on the development of an industrial capitalist class in Canada. For Naylor, Canada never lost

its colonial status, but just continued being dependent on a series of metropolises (France, Great Britain, and the United States) because of the staple orientation of the economy. Mel Watkins, on the other hand, who is generally associated with Innisian foundations, has attempted to bridge the gap between staple theory and Marxist theory through the blending of the staple approach with development theory of a bi-modal (hinterland/metropolis) nature, in particular, the "chain theory" that has characterized the works of Andre Gunder Frank. Watkins has generally emphasized the structural imbalance that exists between a staple economy and the metropolitan centre--an imbalance characterized by an outflow of capital, such as occurs with respect to Third World nations. Such an emphasis will be further demonstrated as being linked to Watkins' early statement on staples.

While the work of Watkins and Naylor has tended to emphasize different aspects of the development of capitalism in Canada, it is intended to demonstrate that within their work there exists a crucial similarity which can lead to problems of analysis--both works are operating essentially at the level of circulation of commodities with little, if any, inquiry into the developing social relations of production.

In examining the works of Watkins and Naylor, discussion will commence with the former.

Mel Watkins: The Hinterland/Metropolis Relationship of Staple Production

The work of Mel Watkins, as it relates to staple theory, can be divided chronologically into two parts for purposes of discussion, with the watershed point at approximately the publication of the Watkins Report. Prior to that period, Watkins had been engaged in an analysis that one could classify as a standard "classical" statement on staple production.

Since that period, however, the emphasis of his analysis has shifted to the hinterland/metropolis aspect of staple theory, and the development of the multinational corporation as a vehicle of staple extraction, resulting in a conceptualization of Canada as in a basically similar relationship to the metropolises as a number of underdeveloped nations.

The early work of Watkins on staples has been discussed in conjunction with the work of Mackintosh, and is possibly one of the better statements of the staple approach in setting out the theory's parameters.

Watkins, basically, conceptualized a model of staple production in which staples, being the leading sector of the economy, served as the basis or "set the pace" of economic expansion around such an export base.

The central concept of a staple theory, therefore, is the spread effects of the export sector, that is, the impact of export activity on domestic economy and society. To construct a staple theory, then it is necessary to classify these spread effects, and indicate their determinants.⁹⁶

Watkins, in turn, places a great deal of emphasis on the character of staple(s) being exported, assuming the resource base of the "new country", the international market, international transportation and communication networks, and the international power structure as given.⁹⁷

From this Watkins then delineated the determinant of technology as it relates to the character of the staples (the production function of staples) and the "degree of factor substitutibility" as specifying the parameters⁹⁸

for economic expansion around staple production. Following from this, therefore, were "demands for factors; demand for intermediate inputs"

(backward linkage); "possibility of further processing" (forward linkage); "and the distribution of income" (final demand linkage)—all of which were⁹⁹

discussed earlier in this work. Watkins delineated the process of capital

formation associated with diversification around an export base. Unlike Mackintosh, however, who held that such diversification was "natural", with particular reference to wheat, Watkins also held that certain factors may intervene to effectively retard any expansion or diversification. Such retardation of diversification around an export (staple) base was seen by Watkins as attributable to a number of factors of varying importance or strength. Firstly, was the "leakage" of income to "'foreign factors'--factors which remit their income abroad--rather than 'domestic factors'". Leakage was viewed as resulting from a need for foreign capital (as either portfolio or direct investment), or the use of migratory labour, the wages of which were remitted to centres outside the staple economy. 100

Related somewhat to "leakages" was the availability of domestic capital and the basis of domestic entrepreneurship; whether there appeared to exist sufficient opportunity for expansion around the export (staple) base, and whether domestic savers preferred to expand domestic activities rather than expand the export industry and import trade or invest abroad. 101 Watkins was hinting to what both he and Naylor later referred to as the development of mercantilism among the domestic capitalists of the staple economy; capitalists with a preference for export-import activities as opposed to industrial expansion of the domestic economy. Such activities, Watkins further pointed out, lead to the development of an "export mentality", and, in turn, a reluctance to promote domestic development. 102

In relation to his later works, it is the effect of leakage and the requirement for foreign capital that appears to be the crucial link between the early work of Watkins, his work on the Watkins Report, and later work where the hinterland/metropolis relationship is emphasized.

With respect to the Watkins Report and his later work, emphasis shifts to the vehicle of leakage--the structure of exploitation and diversification around the export base associated with the multinational corporations.

Watkins, in undertaking a shift of emphasis, has attempted to synthesize Innisian staple theory with development theory of a Gunder Frankian nature. In doing so, he has claimed to have integrated a Marxist analysis with staple theory, in which the capitalist world is portrayed as "structured in terms of the inter-relationship of metropolis and hinterland, and is characterized by hierarchical links in long imperial chains"--a situation caused by "a dialectical process simultaneously creating development and underdevelopment".¹⁰³

Watkins, in applying the Frankian analysis to Canada, argues that first and foremost one must locate oneself within the chain of metropolises and hinterlands.¹⁰⁴ In doing so, Watkins later states that Canada is locked into a position that is "very high up in the chain, a favoured country within the American system".¹⁰⁵ It is a position Canada shared with such nations as Japan and Germany. As he concludes:

No matter how we would draw the line if we rank the American system, it is clear that Canada would be above the line as one of the exploiting nations rather than an exploited nation within the system.¹⁰⁶

With respect to the hypotheses of Frank's which were discussed previously, Watkins emphasized the last two theses--that the hinterland/metropolis system of capitalism penetrates into the domestic economy,¹⁰⁷ and that, as the ties to the metropolis weakens, moderate development occurs in the satellite, therefore the most underdeveloped countries will be tied more closely to the metropolis.¹⁰⁸

A final point that Watkins draws from Frank's analysis is the nature of the national bourgeoisie, that it is predominantly a commercially-oriented class (or more appropriately, class fraction) involved with "primary-commodity exports" and import trade.¹⁰⁹ In doing so, Watkins appears to have come full circle to his relationship to earlier staple theorists such as Innis, and moreso to Creighton, with their emphasis on a similar group in Canada:

Some Canadian writers have been saying these kinds of things but using a different language. The most powerful model for the study of Canada yet developed is, of course, that worked out by Harold Innis, the so-called 'staples theory'. What Innis was talking about is areas where the growth process is led by primary exports and the dominant elite within the colony is committed to exports. The staples theory is really a pseudonym for a kind of imperial relationship.¹¹⁰

In making this synthesis (Innisian with Frankian analyses), the basic process involved in the diversification around an export (staple) base that was depicted in Watkins' earlier works, underwent a modification. Because of the structure involved with staple extraction (multinational corporations) the system of "linkages" became a series of "blockages" to development, attributed to the fact that decision-making on further processing and expansion lay outside the host country, and, therefore, beyond the control and influence of the host country's government--except in the case of making the nations more hospitable to such multinational firms.¹¹¹ Such actions, as exemplified by the National Policy of Macdonald, Watkins argued, was no more than "import substitution industrialization" leading to a different and higher form of dependence on the metropole; an argument similar to that put forward by Osvaldo Sunkel.¹¹² The result, Watkins visualized, is the branch plant economy of Canada.

In concluding, then, Watkins, in synthesizing an analysis based on the work of Innis and Gunder Frank, has, in turn, run the risk of inheriting certain shortcomings of both works. The primary risk one faces in drawing from Innis is the problem of geographical determinism, which was discussed earlier. With Watkins, however, this does not appear to be a problem, as the main thrust drawn from Innis is the centre/margin aspect of Innis' analysis.

It is with respect to the work of Gunder Frank that Watkins appears to have inherited shortcomings. In the first place, problems arose for Watkins with respect to Frank's discussion of Canada within the hinterland/metropolis framework. Frank set apart the white settler colonies (i.e., Canada, Australia, New Zealand, and to a lesser degree South Africa) from the underdeveloped countries of Latin America, Africa, and Asia (the traditional societies) and viewed the white settler colonies as being part of the problem.¹¹³ Furthermore, Canada tends to be a theoretical embarrassment for Frank, with respect to the hypothesis that holds that the most underdeveloped countries will be tied most closely to the metropolis, and that as the ties to the metropolis weaken (for example, during periods of war or depression), moderate development occurs in the satellite. A number of Canadian writers, including some working within the hinterland/metropolis framework, have demonstrated that the degree of integration of the Canadian economy, and a number of its other social institutions, is unmatched by any other nation.¹¹⁴ Also, a recent study has found that the opposite tendency has generally occurred during times of crises. This study found that during periods of crisis there occurred an increased penetration and concentration by American capital in the Canadian economy,¹¹⁵ particularly in sectors in which concentration was initially higher.

Finally, one can note a similarity between what Frank states about the development of underdevelopment, and Watkins' arguments about Canada; that both regions (underdeveloped and Canada) are dominated by a commercial bourgeoisie. As critics of Frank have argued, and as will be demonstrated later, with respect to Naylor's work, such analyses have tended to ignore the formation of exploited classes, the character of such classes, or else have viewed such classes as rather passive masses. As stated by one critic of the dependency school:

It is the analysis of classes and class conflict which is the Achilles heel of dependency theory. To begin with, the most important actors and almost the only ones, are the oligarchies and the bourgeoisie and, in the best of cases, the middle sectors. When the popular sectors make an appearance it is only as passive and manipulated masses. Yet, there are many events which cannot be explained without introducing them as active actors. It is symptomatic that there have been no studies on the subordinated classes arising from the dependency theory perspective.¹¹⁶

What one finds, therefore, with respect to the Frankian analysis, and Watkins application of it to Canada, is the "replacement of exploitation and class conflict by an indeterminate system of national and regional contradictions".¹¹⁷

Tom Naylor: The Continued Dominance of the Canadian Commercial Bourgeoisie:

Possibly no other recent work in Canadian economic history has initiated as much discussion as the work of Tom Naylor, both with respect to his essay, "The Rise and Fall of the Third Commercial Empire of the St. Lawrence", and his two volume work, The History of Canadian Business, 1867-1914.¹¹⁸

Following the trail blazed by Innis, and more so Creighton, Naylor analyses the development of the commercial class which Creighton held so

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 high. Unlike Creighton, however, he places the emphasis on the "destructive", or at least retarding effect which this class had on industrial development within Canada.

Given the abundance of British portfolio capital available, part of it supporting American direct investment, and given the good credit rating of the federal government, it is clear that the influx of direct investment to take advantage of the tariff and to loot natural resources cannot be explained by a shortage of capital.... The real problem was the stultification of indigenous industrial capital by the continued dominance of merchant capital alliance with British finance capital together with the historically rooted characteristics of American capitalism.¹²⁰

For Naylor, the prime motive force appears as the conflict or contradiction between the dominant mercantile class and the embryonic industrial capitalists in Canada, particularly from the period of reciprocity to the period he entitled "the second interregnum" (the period between the world wars).¹²¹ Starting with the basic hinterland/metropolis framework as developed within Innis' work, regarding staple production, Naylor constructed a framework in which Canadian development was viewed as a dependent process; dependent on a succession of metropolises (France, Britain, and the United States) through a number of "phases" or "stages" of European capitalist expansion. Naylor speaks of five "stages", some of them overlapping and having their roots in previous stages. The stages, in order of succession, are: (1) overt theft, plunder, and piracy; (2) trade and covert theft (era of East India and Hudson Bay Co.'s); (3) the Industrial Revolution; (4) the Great Depression of 1873; and (5) the ascendancy of the United States.¹²²

It was within such a framework that the conflict between the mercantile interests and embryonic industrialists was situated. The mercantile interests were linked to the metropolitan centre through staple trade with

Britain and later the United States; a trade involving the flow of raw materials to the metropole, and the movement of finished goods to the hinterland. As such, the Canadian bourgeoisie were predominantly intermediaries at the level of exchange or circulation. This was particularly the case in the period of British domination.

Two fundamental structural attributes of the Canadian economy in the period 1867 to 1914 must be made central to analysis. First it was a colony, politically and economically. In terms of commercial patterns it was a staple-extracting hinterland oriented towards serving metropolitan markets from which, in turn, it received finished goods Canada's social structure, and therefore proclivities of its entrepreneurial class, reflected and reinforced its innate colonialism

A second trait of the economy of the period, in part derivative from the first, was that it had only begun to make the difficult transition from a mercantile-agrarian base to an industrial one. Wealth was accumulated in commercial activities and tended to remain locked up in commerce. Funds for industrial capital formation were in short supply. Commercial capital resisted the transformation into industrial capital except under specific conditions in certain industries, in favour of remaining invested in traditional staple-oriented activities.¹²³

For Naylor, the dominance of such mercantilist interests have implications for the development of an industrial economy within Canada. It would result in a distorted form of industrial development. Depending on which fraction of the bourgeoisie (industrialist or mercantilist) was dominating or initiating industrialization, the result would in all likelihood be either a "flourishing and independent national entrepreneurial class", growing out of capital accumulation in small scale manufacturing or "even artisanal mode of production", or simply a reproduction of "the conservatism of commercial capitalism in a new guise, the development of inefficient non-innovative, and backward industrial structures with a penchant for

dependence on foreign technology, foreign capital, and state assistance".¹²⁴

Naylor held that the results of this dominance by the mercantilists over the industrialization of Canada was reflected in such dependence on foreign industrial capital for the development of an indigenous industrial base in Canada.

The strength of commercial capitalism in Canada was the result of the British colonial connection, and together they served to lock the Canadian economy into the staple trap. The domination of the Montreal commercial community in the colonial economic and political structure was the outgrowth of the pattern of dependence, and the stultification of industrial entrepreneurship followed from their control of the state and state policy most notably with regard to the structure of the federally controlled banking system. The resulting vacuum led directly to the reliance on American industrialism, in the form of entrepreneurs, patents, or direct investments.¹²⁵

The result was that the Canadian economy would not make "the vital transition from commercialism to industrialism".¹²⁶

Within this framework developed by Naylor, the question of the "nature" of railways, and to a lesser extent staples, has been the basis of much of the "discussion" between Naylor and his critics. It is to this point that discussion will now turn, with particular emphasis on the relationship between staples and the nature or activities of the bourgeoisie within Canada.

As indicated earlier, Naylor includes both railways and staple extraction under the umbrella of commercial activities. Much of the discussion between Naylor and his critics has centered on the issue of whether railways constitute a commercial activity or an industrial activity, with the result that anyone following the debate comes under the impression that the debate is irresoluble and that one sits upon the proverbial "horns of

a dilemma", as all parties in the debate declare that the opposition has
 misinterpreted a "supreme authority" (Marx).¹²⁷ While it is not the inten-
 tion of the author to be drawn into the dog-fight over railways, what is
 important, and must be made clear, is the level at which Naylor poses the
 problem of railways and staple extraction. In his work, as pointed out
 earlier, Naylor's analysis is at the level of the circulation of commodities
 between nations, and the relations between the respective bourgeois interests;
 between such interests in both the hinterland and the metropole.¹²⁸ The
 involvement of the Canadian bourgeoisie in staple production is viewed in
 terms of being a commercial undertaking. The bourgeoisie acted as middle
 men in the movement of commodities between markets. As mercantilists, their
 basic activity was buying cheap and selling elsewhere at a high price.

While such a characterization may appear adequate for such staple
 commodities as fish and fur; and to a lesser extent square timber and wheat;
 it appears somewhat inadequate for the nature of capitalist development
 associated with the "industrial staples" of pulp and paper, minerals, and
 petroleum. As Ryerson illustrates with respect to the treatment of staples
 by Naylor; he "evades the fact that the staple is in any event a product,
 involving for its output capital, equipment, workers (whose labour embodies
 the 'value added' whose surplus over and above their keep is the source of
 accumulated capital as well as profit). Resource extraction is an industry".¹²⁹
 Naylor, possibly because of the fact that labour was not directly considered
 in his work, appears not to have considered the particular social context in
 which the staples were produced. He appears to have assumed that the mode
 of production was either constant, or else neutral, throughout the develop-
 ment of capitalism within Canada.

Furthermore, as pointed out by Ryerson, the characterization of the Canadian bourgeoisie as commercial or mercantilists is ahistorical, for the bourgeoisie of pre-industrial Canada is equated with the bourgeoisie of an industrializing Canada. There rests a confusion within such a characterization. As Ryerson states:

The concept merchant's capital as precursor of industrial capital (Marx's 'capital as such') has to do with a definite historical stage of development: that of the so-called primitive accumulation of capital in the 16th. to 18th. centuries. Its ideological expression in that period was mercantilism. Equating pre-industrial mercantilism with the era of finance-capital, state-monopoly intervention and imperialism simply confuses the terminal phase of capitalism with the pre-natal one.¹³⁰

Where the classification of the commercial activity and staple production appear to diverge, i.e., where staple production undergoes a transition in relation to the mode of production from "traditional staples" to the "industrial staples", Naylor has developed the concept of resource industries, as opposed to staple production, to refer to the "industrial staples".¹³¹ It appears that he has classified them in such a manner so as to differentiate them from the earlier "traditional staples". The role of Canadian capital in industrial staples at any time during the period covered by his work, History of Canadian Business, was, at best, given cursory treatment as such production does not appear to fit well within the commercial-traditional staple framework used by Naylor.¹³² Where Canadian capital has flowed into mining it was generally viewed in terms of speculation on the part of investors, particularly when these same investors are of the "commercial bourgeoisie", such as the activity of Henry Pellatt Sr., George Cox, William MacKenzie, and Donald Mann.¹³³ Foreign investment in mining, on the other hand, was viewed as part of the

natural expansion across the border, either by individual entrepreneurs,¹³⁴ or the extension of production by American industrial interests. His discussion of such products (pulp and paper, minerals, and petroleum), therefore, focussed only on foreign involvement in such industries, particularly with respect to the work, History of Canadian Business.¹³⁵

In summary, the discussion of staples by Naylor, in being classified as a commercial activity, has resulted in a confusion stemming from two crucial aspects of his characterization of mercantile. Firstly, the fact that no fundamental distinction is made between the mercantile activity of the bourgeoisie in pre-industrial Canada from the nature of the bourgeoisie during and after industrialization, a bourgeoisie associated with the growth of monopoly and finance capital. Secondly, the fact that the production of staples occurs under various social contexts, that each staple is associated with a specific mode of production; Naylor either takes for granted or ignores this fact, that in the final analysis, even the profits of the commercial capitalists result from the appropriation of a surplus from producers situated in some specific mode of production.

To understand the Canadian bourgeoisie one should investigate its relationship to the particular context in which the production of the staples takes place, rather than the relationship of the Canadian bourgeoisie to the movement of such staples to various metropolises. In the example being used, the mining industry, discussion will, therefore, focus on these two aspects: (1) the mode of production associated with the mining industry, and (2) the nature of involvement of the Canadian bourgeoisie, as mercantile, industrial, or finance capital at the level of the mode of production.

Summary:

In this chapter I have attempted to illustrate a particular set of related analyses generally referred to as the staples approach. While discussion has not, by any stretch of the imagination, been exhaustive in terms of representing the full range of the approach, emphasis has concentrated on delineating the "classical staple theories" of Mackintosh, Innis, and Creighton--and on derivatives involving "attempts" at synthesizing, or at least posing, "staples theory" within a Marxist framework.

In discussing the work of Mackintosh, it was illustrated that he had developed a model of economic growth involving expansion around a staple base, resulting in the eventual industrial development of the staple economy. As illustrated, however, Mackintosh does not account for the international structure of the capitalist market associated with staple production; a structure in which "leakage" of income from staple production could effectively retard the developing staple economy.

While Mackintosh tends to view staple production as the key to economic growth, it was illustrated that Harold Innis had emphasized that, because of the imperial context (or hinterland/metropolis) of the relationship surrounding the production of staples, the development of the staple economy would be a dependent process preventing or retarding such an economy from developing into a "self-generating" industrial economy. Further, within the centre-margin framework, Innis places emphasis on the character of the staple (including its relationship to geographic factors), techniques of exploitation, and demand for staples (arising out of the centre-margin relationship); as well as the interrelationship between them. This emphasis on technique and geographic factors, however, posed certain problems

for Innis, and for anyone attempting to synthesize from Innis and Marx; as Innis emphasized the forces of production as opposed to the mode of production under which staples were produced.

The work of Creighton, parallelling Innis, was discussed, emphasizing the two-pronged thrust of Creighton's analysis. On the one hand, Creighton dealt directly with the mercantilists involved in the trade of staple commodities. In discussing this "class" (or, more appropriately, class fraction), Creighton emphasizes the conflicts with other groups (that is, the French-Canadian absolutists state, American commercial interests, British colonial officials, and, later, Upper-Canadian agrarian interests), while the commercial class attempted to exploit the "natural" empire they had inherited. It was the geographic constraints of the "natural" empire of the St. Lawrence which constituted the second major thrust of Creighton's analysis. As stated earlier, this emphasis on the "natural" aspect of geographic factors gave Creighton's work an air of geographic determinism; a situation in which geography overshadows class as the dynamic, as the conflicts involving the commercial class were viewed as rooted in the imperatives of the "natural empire".

Growing out of the work of Innis and Creighton have been endeavours at trying to fit the staple approach into a Marxist framework; of which discussion focussed on the works of Mel Watkins and Tom Naylor.

In analysing the work of Watkins, emphasis has been on illustrating his attempt to link staple theory with "bi-modal" development theory (hinterland/metropolis theory), such as characterized by the "chain theory" of Andre Gunder Frank. It was illustrated that, drawing from basically the "classical staple theory" such as is characterized by Innis, Watkins

emphasized the hinterland/metropolis aspect of staple theory, and attempted to develop that aspect of the theory in light of the work of Frank. It was argued, however, that in doing so, Watkins' analysis has not centered on class exploitation and conflict, but rather on national and regional contradictions. For Watkins, the dynamic appeared to lie at the level of international markets (including investment patterns).

The final writer discussed in this chapter, Tom Naylor, is to some extent the intellectual heir of Creighton. Unlike Creighton, however, Naylor did not have the high regard for the commercial class, but emphasized their destructive effect on industrial development. Discussion on Naylor illustrated that development was viewed as occurring within a hinterland/metropolis framework with respect to staple production--a process of dependency on a series of metropolises. It was illustrated that within such a framework Naylor situated the conflict between the mercantile and industrial interests. Naylor, by characterizing staple production as a commercial activity, has added to the confusion, since no distinction is made between the mercantilism of pre-industrial capitalism from the monopoly and finance capitalism of developing imperialism. Confusion also arises in that various staples were produced under specific social contexts, or modes of production.

Both Watkins and Naylor appear to have operated at the level of the exchange of commodities: Watkins in terms of contradictions arising out of the international structure of the market; Naylor in emphasizing a class fraction initially tied into the trade of such staple commodities. Neither writer seemed to have become involved in any investigation into the developing social relations of production. As such, they appear, to a certain extent, not to have advanced much past Innis, since Innis dealt with the

effect of staples on the development of social relations. As Innis states:

Concentration on the production of staples for export to more highly industrialized areas of Europe, and later on the U.S. had broad implications for the Canadian economic, political, and social structure. Each staple in its turn left its stamp, and the shift to a new staple invariably produced a period of crises in which adjustments in the old structure were painfully made and a new pattern created in relation to a new staple.¹³⁶

It was pointed out earlier that in the analysis of mining from a staple perspective, the only comprehensive analysis was done by H.A. Innis. The analysis of mining on the part of Innis was characterized by the concept of cyclonics, whereby the development of mining and transportation systems were linked in such a way that a change in the technique of transportation would have a dramatic impact on mining, both in terms of providing the means to apply improved methods and equipment, and in cheapening the cost of transportation of staple commodities. Among other staple theorists, mining was generally discussed within the context of a larger analysis, if mentioned at all. Mackintosh viewed mining in light of the spread effects associated with the expansion around the wheat economy. Watkins and Naylor treated mining, along with the other segments of the Canadian economy, as opposite sides of the same coin. In his analysis, Watkins stressed the "foreign" involvement in Canadian mining and the flow of capital and natural resources abroad; while Naylor argues that indigenous capital played the role of commercial capital, generally becoming involved with mining only as a speculative venture. The treatment of mining within the staple paradigm, therefore, has been posed at the level of circulation-- at the level of the movement of staple commodities and capital, and improvements in the networks for their movement.

In dealing with mining, discussion will involve moving in a direction opposite to that of Innis, who viewed the trade in staples as shaping the development of social relations. Staple production should be viewed in terms of reflecting the development of, and changes in, the modes of production and social formations, as well as the changing forces of production. In moving in an opposite direction to Innis, and staple theories in general, the work of H.C. Pentland and Stanley Ryerson will be crucial
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to any ensuing discussion.

NOTES TO CHAPTER II

1. While Watkins will be the centre of discussion, the concept of hinterland/metropolis has been central to a number of works, including those of Robert Laxer, Kari Levitt, and a number of works in the collections of Gary Teeple and Ian Lumsden. See: Robert M. Laxer, Canada Ltd.: The Political Economy of Dependency. (Toronto, 1973); Kari Levitt, Silent Surrender: The Multinational Corporation in Canada. (Toronto, 1972); Ian Lumsden, Close to the 49th Parallel, etc./The Americanization of Canada. (Toronto, 1970).
2. Both Daniel Drache and Mel Watkins have associated Naylor's work with a Marxist or Neo-Marxist analysis of the development of capitalism in Canada. See: Daniel Drache, "Rediscovering Canadian Political Economy", Journal of Canadian Studies (1976), p. 3 and Mel Watkins, "The Staple Theory Revisited" (unpublished, 1976), pp. 10-13.
3. M.H. Watkins, "The Staple Theory Revisited" (unpublished, 1976), p. 1.
4. This confusion associated with staple "theory" and all its developments is evident in a recent presentation of one of its proponents (Mel Watkins). It appears, according to Watkins, that the work of Wallace Clement can be associated with the staples approach. "Ibid.", pp. 13-14.
5. Daniel Drache, "Rediscovering Canadian Political Economy", Op. cit., p. 6. Watkins, "Op. cit.", pp. 2-5.
6. Mackintosh cites his indebtedness in particular to Frederick J. Turner's Rise of the New West and Guy S. Callander's Readings in the Economic History of the United States. See: W.A. Mackintosh, "Economic Factors in Canadian History", in Easterbrook and Watkins (eds.), Approaches to Canadian Economic History, pp. 3-5. As Mel Watkins and G.W. Bertram have both pointed out, the work of Guy S. Callander was, possibly, one of the first statements on the importance of staples in the economic development of the United States. See: Watkins, "A Staple Theory of Economic Growth", p. 49n, and G. W. Bertram, "Economic Growth in Canadian Industry, 1870-1915: The Staple Model", p. 75n, both works in Easterbrook and Watkins, Ibid.
7. Daniel Drache, "Op. cit.", p. 8.
8. W.A. Mackintosh, "Op. cit.", p. 14.

9. Such a model as was developed by Mackintosh should not be confused with the "take-off" hypothesis of W.W. Rostow, which has been developed more recently. Certain possible similarities between the two models have been discussed by M. Watkins, Douglass C. North, and Gordon W. Bertram.

Watkins notes certain similarities in that both staple theory and the work of Rostow attribute two similar characteristics to the "new countries" for which staple theories apply: a favourable man/land ratio and an absence of inhibiting traditions. While noting these initial similarities, Watkins disagrees with the hypothesis that a country whose wealth is achieved through the exploitation of land and natural resources will delay their "take-off" stage. As Watkins states:

It is frequently alleged, at least implicitly, that the achievement of a high level of national income masks deficiencies in the structural balance of the economy. W.W. Rostow charges that the high levels of welfare achieved in new countries by exploiting land and natural resources will delay their reaching the "take-off" stage.⁷⁵ If the concept of take-off is interpreted as meaning simply the growth and diversification of the manufacturing sector, this argument runs counter to the staple theory. Rostow's claim, however, is no more than an untested hypothesis. He has not outlined the specific mechanism by which primary exports delay industrialization. It is not clear that he is saying anything more than that if a country has a comparative advantage in primary exports it will perforce have a comparative disadvantage in manufactures.

Douglass C. North reaches a similar conclusion to Watkins' with regard to the works of Rostow as they compare to the staple theory. North illustrates this difference:

In short, one could advance a hypothesis which is the reverse of Rostow's, namely, that the opening up and development of new areas capable of producing primary goods in demand in the existing markets induced the growth of industrialization.⁴

This is the staple theory as stated basically by Mackintosh. G.W. Bertram has attempted a comparison of the staple approach and the work of Rostow with the view to determine the relevance of Rostow's model for analytical purposes. Bertram reaches the conclusion that Rostow's hypothesis does not fit the Canadian situation, for much of what was the focus for expansion in Canada did not lie in the leading sector set out by Rostow as contributing to the "take-off". As Bertram states:

In view of its growth, linkages, and incomes effects, the propulsive sector in the period 1896-1914 appears to have been wheat and the lines of causation were the reverse of Rostow's. The backward linkages of the western wheat industry are determined by the production function of wheat and its rapid growth meant an expanding demand for the inputs of labour, capital, and other supplying organizations and agencies. In respect to labour inputs, western wheat production techniques required and attracted large numbers of both migrant and immigrant settlers. The production function of wheat also determined a form of farm organization of simple proprietorships using relatively little wage labour. This type of economic unit had considerable significance for the pattern of income distribution and the consequent secondary effects on other industries.

As a result, Bertram concludes:

While economic historians are indebted to Professor Rostow for his discussion of the prerequisites to economic growth, his employment of a stage model does not contribute to an isolation of the main variables involved in Canadian economic growth.

Basically, then, the staple approach such as was used by Mackintosh, as well as the work of Rostow, while noting similarities in the initial periods of the "new countries", have attributed the expansion of the new countries to different forces, as the three authors quoted have illustrated. See: Mel Watkins, "A Staple Theory of Economic Growth", Op. cit., pp. 57, 61-62. Douglass C. North, "A Note on Professor Rostow's 'Take-Off' into Self-Sustained Growth", Manchester School of Economics and Social Studies (January 1958), pp. 68-75. Gordon W. Bertram, "Economic Growth and Canadian Industry, 1870-1915: The Staple Model and the Take-off Hypothesis", Canadian Journal of Economics and Political Science. Vol. XXIX, No. 2 (May 1963), pp. 162-184.

10. W.A. Mackintosh, "Some Aspects of a Pioneer Economy", Canadian Journal of Economics and Political Science, Vol. 11, No. 4 (November 1936), pp. 458-459.
11. W.A. Mackintosh, "Economic Factors in Canadian History", Op. cit., p. 4.
12. W.A. Mackintosh, The Economic Background of Dominion Provincial Relations. (Toronto, 1964), p. 39.
13. Mackintosh, "Economic Factors in Canadian History", Op. cit., p. 14.
14. Mackintosh, "Ibid.", p. 13.

15. Mackintosh, "Some Aspects of a Pioneer Economy", Op. cit., p. 462.
16. Mackintosh, "Ibid.", p. 460.
17. Mel Watkins, "A Staple Theory of Economic Growth", Op. cit., p. 54.
18. Watkins, "Ibid.", pp. 53-55. Watkins borrowed the terms backward linkage, forward linkage, and final demand linkage from the works of Albert O. Hirschman, and applied them to the staple theory. In Hirschman's work, linkage effects dealt with the export sector as a whole (including manufactured goods).
19. "Ibid.", p. 55.
20. "Ibid.", p. 55.
21. "Ibid.", p. 55.
22. "Ibid.", p. 55.
23. Mackintosh, "Some Aspects of a Pioneer Economy", Op. cit., p. 460. The factors that have to be overcome are basically similar to what Mel Watkins has referred to as determinants of staple production:

Let us begin with the determinants. Assume to be given the resource base of the new country and the rest-of-the-world environment--the international demand for the supply of goods and factors, the international transportation and communications networks, the international power structure. The sole remaining determinant can then be isolated, namely, the character of the particular staple or staples being exported.

Watkins, "A Staple Theory of Economic Growth", Op. cit., p. 59. While Watkins views the international transportation and communication network as a determinant, Mackintosh places a fair degree of importance on the penetration of such networks into the pioneer economy for the development of such an economy into a mature economy. The building of the Canadian Pacific and the Grand Trunk can be viewed as part of the penetration of the international transportation network within Canada, since such railways are associated by Mackintosh with the movement of staple products for exports.

24. Watkins, "A Staple Theory of Economic Growth", Op. cit., pp. 55-56.
25. The "leakage" of income from staple production, as well as manufacturing, to foreign factors was demonstrated by Levitt in Silent Surrender, particularly in the Appendix. See: Levitt, Silent Surrender: The Multinational Corporation in Canada. (Toronto, 1970).

26. Drache, "Rediscovering Canadian Political Economy", Op. cit., p. 13.
27. Innis, quoted in Drache, "Ibid.", p. 9.
28. While Innis appears never to directly spell out what was involved with the concept of cyclonics, it is certainly implicit in his works. For a rather elaborate discussion of cyclonics in relation to Innis's work, see Robin Neill, A New Theory of Value/The Canadian Economics of H.A. Innis. (Toronto, 1972), particularly chapters 3 and 4.
29. Carl Berger, The Writing of Canadian History. (Toronto, 1976), p. 97.
30. H.A. Innis, The Fur Trade in Canada. (Toronto, 1970), p. 385 (originally published in 1930).
31. H.A. Innis, "Liquidity Preference as a Factor in Industrial Development", in Essays in Canadian Economic History. (Toronto, 1956), pp. 330-331, 356.
32. Robin Neill, Op. cit., p. 44.
33. H.A. Innis, The Fur Trade in Canada, p. 393.
34. Neill, Op. cit., p. 46.
35. Innis, The Fur Trade in Canada, p. 389.
36. Innis, Ibid., p. 390.
37. Innis, Ibid., pp. 16-22.
38. Innis, Ibid., p. 166.
39. Innis, Ibid., pp. 113-114.
40. Berger, Op. cit., p. 95.
41. Innis, The Fur Trade in Canada, pp. 176-177.
42. Innis, Ibid., pp. 257-262.
43. Berger, Op. cit., p. 95.
44. Innis, The Fur Trade in Canada, p. 262. Also see: Donald Creighton, The Empire of the St. Lawrence. (Toronto, 1956).
45. Innis, The Fur Trade in Canada, p. 393.
46. Innis, "Transportation as a Factor in Canadian Economic History", in Essays in Canadian Economic History, p. 67.

47. Innis, "Ibid.", pp. 68-71.
48. Innis, "Settlement and the Mining Frontier", Op. cit., p. 171.
49. Innis, "Ibid.", pp. 196-198. In another work, Innis presents the notion that the Klondike rush not only led to the building of the White Pass railway, but also "had its effect in hastening construction of two additional transcontinental railways which became the basis of the Canadian National Railways" (Grand Trunk Pacific and the Canadian Northern, presumably). Innis, "Liquidity Preference as a Factor in Industrial Development", Op. cit., p. 356.
50. Innis, "Settlement and the Mining Frontier", Op. cit., p. 279, 282-306.
51. Innis, "Ibid.", p. 321.
52. "Ibid.", pp. 391-394.
53. Innis, "Ibid.", pp. 264-265, 267-269.
54. "Ibid.", pp. 263-267.
55. "Ibid.", pp. 282-283, 306, 315-317.
56. Innis, "Ibid.", pp. 406, 314-315.
57. Innis, "Ibid.", pp. 308-312.
58. "Ibid.", p. 375.
59. "Ibid.", p. 382.
60. "Ibid.", p. 307.
61. "Ibid.", p. 403.
62. "Ibid.", p. 406.
63. Innis, "The Canadian Mining Industry", in Essays in Canadian Economic History, p. 320.
64. Daniel Drache, "What Passes for Canadian History?", Canadian Dimension (January 1972), p. 41.
65. Innis, "Settlement and the Mining Frontier", Op. cit., pp. 220-222.
66. Stanley Ryerson, "Conflicting Approaches in the Social Sciences", The Marxist Quarterly (Spring 1962), No. 1, p. 60.
67. Innis, "Settlement and the Mining Frontier", Op. cit., p. 177. The equating of industrialism and capitalism is also noticeable in a number of Innis's writings in Essays in Canadian Economic History. For example see "Recent Developments in the Canadian Economy", pp. 298-299.

68. Innis, "Government Ownership and the Canadian Scene", in Essays in Canadian Economic History, pp. 82-84.
69. Stanley Ryerson, "Op. cit.", pp. 59-60.
70. Ryerson, "Ibid.", pp. 61-62. Also, for a similar but more expanded discussion on Innis's work on communications, see Daniel Drache, "Harold Innis: A Canadian Nationalist", Journal of Canadian Studies, Vol. IV, No. 2 (May 1969). For an example of the Innisian concept of monopoly see H.A. Innis, "The Concept of Monopoly and Civilization", University of Toronto Archives (unpublished paper), 1951.
71. Berger notes this relationship between Innis and Creighton:

Innis's study of the formative role of the fur trade in shaping Canadian development was the most important single intellectual influence on the evolution of Creighton's own views of Canadian history. The themes that Innis isolated--the organization of the nation around the waterways, the centralized character of Canada's institutions, the crucial place of staple commodities, Canada's dependence on metropolitan markets, the instability and vulnerability of her economy, the North West Company as the predecessor of Canada itself--were all eventually incorporated in Creighton's own work. Though he built upon foundations that Innis had laid, however, the resulting structure was different in many ways.

Berger, Op. cit., p. 212.
72. While Creighton is probably the main protagonist of the Laurentian thesis, a number of other authors have followed the same course. For a discussion of the people associated with the theme see John Warnock, "Metropolis/Hinterland: A Lost Theme in Canadian Letters", Canadian Dimension, Vol. 16, No. 2 (June 1974), pp. 42-46; W.L. Morton, "Clio in Canada: The Interpretation of Canadian History", in Canadian Historical Readings, Volume 1: Approaches to Canadian History. Carl Berger (ed.). (Toronto, 1967), pp. 42-49.
73. Donald Creighton, "The Decline and Fall of the Empire of the St. Lawrence", Canadian Historical Association, Historical Papers. (1969), p. 16.
74. Berger, The Writing of Canadian History, p. 213.
75. Donald Creighton, The Empire of the St. Lawrence. (Toronto, 1956), p. 19. The points where the clashes occurred between the economy of the St. Lawrence and the rival economies were generally at heights of land between them, such as between the St. Lawrence and Hudson River systems, as well as between the St. Lawrence and rivers flowing into James and Hudson Bays.

76. Creighton, Ibid., pp. 87-88.
77. Creighton, Ibid., p. 115.
78. Ibid., p. 71.
79. Ibid., p. 7.
80. Berger, The Writing of Canadian History, p. 212.
81. Creighton, The Empire of the St. Lawrence, pp. 22-23.
82. Creighton, Ibid., p. 28.
83. Ibid., pp. 30-34.
84. Ibid., pp. 40, 45-50. Also see: Creighton, "The Commercial Class in Canadian Politics, 1792-1840", Proceedings of the Canadian Political Science Association, Vol. V.(1933), pp. 45-46.
85. Creighton, The Empire of the St. Lawrence, pp. 74-83.
86. Creighton, Ibid., pp. 89-90. Also, "The Commercial Class in Canadian Politics", Op. cit., pp. 46-49.
87. Creighton, The Empire of the St. Lawrence, p. 107.
88. Creighton, Ibid., pp. 87-88.
89. Ibid., pp. 154-155, 159-161. Also see: "The Commercial Class in Canadian Politics", Op. cit., pp. 51-54.
90. Creighton, The Empire of the St. Lawrence, pp. 258-259, 261-263, 269-281.
91. Creighton, Ibid., pp. 248-254, 346-349, 358-360.
92. Berger notes that Creighton's work has been viewed by some social scientists as involving a near Marxist analysis of class. However, Ryerson has argued that analyses such as Creighton's and later Naylor's, do not constitute a Marxist class analysis, but rather ignore or just do not deal with such fundamental dynamics as class struggle. See: Berger, The Writing of Canadian History, p. 216.
Ryerson, "Conflicting Approaches in the Social Sciences", Op. cit., pp. 59-60, and Ryerson, "Who's Looking after Business?", This Magazine, Vol. 10, No.'s 5 and 6 (November-December 1976), pp. 44-46.
93. The role played by the application of technology to transportation resulting in the removal of geographic constraints is particularly argued by Innis in Settlement and the Mining Frontier. This is stressed with respect to the development of the airplane, and the gasoline and deisel engines.

94. Creighton, The Empire of the St. Lawrence, pp. 6-7. This emphasis on geographic factors has led Stanley Ryerson to quip:

A whole fashionable school of histography has grown up around the pull of the St. Lawrence--a sort of riparian demurge!
- Ryerson, "Conflicting Approaches in the Social Sciences", Op. cit., p. 60.
95. Officially, the Watkins Report is entitled Foreign Ownership and the Structure of Canadian Industry: Report of the Task Force on the Structure of Canadian Industry. (Ottawa, 1968).
96. Watkins, "A Staple Theory of Economic Growth", Op. cit., pp. 53-54.
97. Watkins, "Ibid.", p. 54.
98. Watkins, "Ibid.", p. 54.
99. Watkins, "Ibid.", pp. 54-56. This aspect of Watkins' analysis has previously been discussed in the section of Mackintosh. See: Supra, pp. 9-10.
100. Watkins, "A Staple Theory of Economic Growth", Op. cit., pp. 55-56.
101. Watkins, "Ibid.", p. 59.
102. Watkins, "Ibid.", p. 62.
103. Mel Watkins, "Resources and Underdevelopment", in Robert Laxer (ed.), Canada (Ltd.): The Political Economy of Dependency. (Toronto, 1973), p. 111.
104. Watkins, "The Branch-Plant Condition", in A.K. Davis (ed.), Canadian Confrontations: Hinterland vs. Metropolis. Edited Proceedings of the Eleventh Annual Meeting of the Western Association of Sociology and Anthropology, Banff, Alberta (December 28-30, 1969), p. 35.
105. Watkins, "Ibid.", p. 39.
106. Watkins, "Ibid.", p. 40.
107. Watkins, "Ibid.", p. 35.
108. Watkins, "Ibid.", p. 36.
109. Watkins, "Ibid.", p. 36.
110. Watkins, "Ibid.", p. 40.

111. Watkins, "Resources and Underdevelopment", Op. cit., pp. 113-115. Also see: Watkins, "Economic Development in Canada", in I. Wallerstein (ed.), World Inequalities. (Montreal, 1975), pp. 83-84, 91-92. Watkins uses the example of INCO, and its actions with regard to its construction of a nickel refinery in Canada, as an example of the "blockage" of Canadian development by foreign-based multi-nationals, particularly with respect to INCO's activity during World War I. See: "Economic Development in Canada", pp. 80-84.
112. Watkins, "The Branch-Plant Condition", Op. cit., pp. 37-38. Also see: Osvaldo Sunkel, "Transnational Capitalism and National Disintegration in Latin America", Social and Economic Studies, Vol. XXII, No. 1 (March 1973), pp. 132-176.
113. Watkins, "The Branch-Plant Condition", Op. cit., pp. 36-37.
114. One only has to read any of the number of writers whom Watkins has included under the rubric of staple theory. Watkins, "Staple Theory Revisited", pp. 10-14. Also see: Kari Levitt, Op. cit.; Tom Naylor, History of Canadian Business, 1867-1914, 2 volumes. (Toronto, 1975); W. Clement, The Canadian Corporate Elite. (Toronto, 1975), chapter three, pp. 97-124; Clement, "A Mature Branch Plant Economy: Canada and the U.S. Sphere of Influence", paper presented at the Canadian Political Science Association meetings, Laval University, Quebec City (May 1976), for discussions of Canadian-American economic integration--although these examples do not, by any means, exhaust the topic.
115. M. Clark, "A Critical Approach to Theories of Development: the Canadian Paradox", unpublished paper (May 1976), pp. 25-46. With respect to Frank's hypothesis that in times of crises (i.e., war or depression), the links to the metropole will weaken, and that indigenous development grew, Clark concludes that the opposite occurred in relation to Canada. Clark undertakes a sectoral analysis of the Canadian economy and finds that during such crises American penetration did not decline, and, in fact, in some sectors it increased.
116. Augustin Cueva, "A Summary of 'Problems and Perspectives of Dependency Theory'", Latin American Perspectives, Vol. III, No. 4 (Fall 1976), p. 14. Also see: Ronald Chilcote, "Dependency Theory: A Critical Synthesis of the Literature", Latin American Perspectives, Vol. I, No. 1 (Spring 1974), p. 14.
117. Cueva, "Op. cit.", p. 13.
118. The discussion on Naylor's analysis in his essay, "The Rise and Fall of the Third Commercial Empire", in G. Teeple (ed.), Capitalism and the National Question in Canada. (Toronto, 1972), pp. 1-41, has generally resulted in the view that Naylor has softened his position with respect to the differences and antagonism between merchants (commercial) interests and industrial interests, particularly in the book, History of Canadian Business, 1867-1914.

As a result, discussion will centre mainly on the above-mentioned book, and a recently published essay in which the above argument has been modified, "Dominion of Capital: Canada and International Investment", in Alkis Kontos (ed.), Domination. (Toronto, 1975), pp. 34-68.

Besides "The Rise and Fall of the Third Commercial Empire", much of the debate over the merchant/industrial antagonism centres around the following pieces of work: Simon Rosenblum, "Economic Nationalism and the English-Canadian Socialist Movement", Our Generation, Vol. XI, No. 1 (Fall 1975), pp. 5-15; Tom Naylor, "Commentary", Our Generation, Vol. XI, No. 1 (Fall 1975), pp. 17-23; Steve McBride, "Setting Naylor Straight", Canadian Dimension, Vol. X, No. 2 (June 1974), pp. 2, 56; Tom Naylor, "Setting Naylor's Critics Straight", Canadian Dimension, Vol. X, No. 5 (November-December 1974), p. 63; L.R. MacDonald, "Merchants Against Industry: An Idea and its Origins", Canadian Historical Review, Vol. LVI, No. 3 (September 1975), pp. 263-281; Tom Naylor, "Merchants Against Industry: A Comment", unpublished, 30 pages.

119. Naylor's work, while bearing a "strong Innisian stamp", derives such influence "second or third hand". See: Naylor, "Commentary", Op. cit., p. 23, ff. 1.
120. Naylor, "The Rise and Fall of the Third Commercial Empire of the St. Lawrence", Op. cit., p. 24.
121. Naylor, "Ibid.", pp. 28-30.
122. Naylor, "Dominion of Capital: Canada and International Investment", Op. cit., pp. 35-39.
123. Naylor, History of Canadian Business, Vol. I, pp. 3-4.
124. Naylor, "Dominion of Capital: Canada and International Investment", Op. cit., p. 52. Also see: History of Canadian Business, Vol. II, pp. 282-283.
125. Naylor, History of Canadian Business, Vol. II, p. 283.
126. Naylor, Ibid., p. 284.
127. This is particularly the case in the debate between Naylor and McBride and L.R. MacDonald, where the issue of what Marx had stated about railways came into prominence. MacDonald's essay, in particular, brings out one problem with Naylor's classification of transportation, when, according to the criteria used by Naylor to distinguish commercial from industrial, railways could be classified as an industrial activity, since this involves long-term high-risk investment, and a high ratio of fixed to circulating capital.
L.R. MacDonald, "Op. cit.", p. 267.

128. Naylor, "Dominion of Capital: Canada and International Investment", Op. cit., p. 34.
129. Stanley Ryerson, "Who's looking after Business?", This Magazine, Vol. X, No.'s 3 and 4 (November-December 1976), p. 42.
130. Ryerson, "Ibid.", p. 44.
131. Naylor, "Dominion of Capital: Canada and International Investment", Op. cit., p. 58. Also see: History of Canadian Business, Vol. II, pp. 78-98.
132. This cursory treatment of minerals is noticed in his discussion on the wheat boom and the fact that he notes at one point during this period (1896-1914) that minerals were the leading sector in exports. This expansion was attributed by Naylor to the Klondike gold rush in large part. However, it appears little investigation was done into other possible mineral discoveries and developments. Naylor, History of Canadian Business, Vol. I, pp. 11-12. Further, in the second volume of History of Canadian Business, in which the treatment of mining is covered in relation to foreign investment, Canadian involvement is, for the most part, ignored.
133. Naylor, History of Canadian Business, Vol. I, pp. 214-215.
134. Naylor, History of Canadian Business, Vol. II, pp. 97-98.
135. Naylor, History of Canadian Business. Vol. II, pp. 78-97.
136. H.A. Innis, Empire and Communications (1972), p. 5. Quoted in Daniel Drache, "Rediscovering Canadian Political Economy", Op. cit., p. 7.
137. The works of Pentland and Ryerson have been included in the broad category of staple theory by Watkins. With no intention of going into lengthy discussion on this point, however, it appears to the author that, by including these writers as part of the staple theorists, this seems to stretch the staple thesis beyond any recognition. See: Watkins, "The Staple Theory Revisited" (unpublished), pp. 13, 17-19.

CHAPTER III

FEUDALISM, CAPITALISM AND
THE CHANGING SOCIAL RELATIONS
OF PRODUCTION IN MINING

The focus of discussion in this chapter will be the particular nature of the social relations of production within mining in the feudal, petty commodity, and capitalist modes of production. Whereas in the first chapter, and to some extent in the second, discussion centered on a somewhat abstract level, here it will focus on the more concrete level of the particular character of social relations of production and forces of production associated with mining. This chapter will, therefore, be essentially descriptive; the purpose being to describe the development of mining within the context of modes of production, emphasizing the social relations of production associated with the feudal, petty commodity, and capitalist modes of production, and the development of such relations in conjunction with the transition from a pre-capitalist to the capitalist mode.

In earlier discussion on the concept of modes of production, it was illustrated that among the various conceptualizations there existed a certain common ground--that a mode of production encompasses the economic foundations of a social formation, on which various elements of the superstructure are conditioned and, in turn, condition the economic foundation. Such an economic foundation will serve as the basis for discussing the development of mining. In doing so, attention will be given to relations of production (property relations and relations of appropriation, i.e., possession or control of the means of production and products of labour) and

the corresponding material forces of production (labour process and technology) associated with mining within the feudal, petty commodity and capitalist modes of production.

Discussing mining in such a fashion runs the risk of presenting a static description of its various forms within the respective modes of production. In order to overcome such a problem, this chapter will consist of three sections, each dealing with mining in terms of the feudal, petty commodity and capitalist modes of production. In examining modes of production, however, the concentration will be not only on the nature of the property relations, but also on the internal dynamic of the modes, and forces associated with the transition from the pre-capitalist to capitalist mode of production.

In analysing the development of mining through the various modes of production in this chapter much of the material will involve the development of mining in Britain, although other regions, particularly Germany and the United States, will also be discussed. The purpose of placing emphasis on mining's development in Britain is two-fold. Firstly, development of mining in Britain had an indirect effect on the early development of mining in Canada and the United States in that a substantial portion of the labour force and technology originated in Britain. Later, the United States played a somewhat similar role, although of greater importance, particularly with regard to technology and capital, and, in a lesser sense, to the supply of a trained labour force in the Kootenays. The nature of the labour process during the early development of mining in Canada (before 1880) in ways reflected its heritage in British mining. The second reason for concentrating on the nature of mining in Britain is the availability of historical material on industrial development in Britain, both

in terms of mining, and of industrial development in general.

Mining and the Feudal Mode of Production:

In discussing mining within the feudal mode of production, what is being dealt with is, essentially, a peripheral activity in an otherwise agriculturally-oriented social formation.¹ The nature of the relationship between the producer and non-producer initially paralleled such relations within the realm of agricultural production. Such a parallel was, however, not continuous as mining appeared to undergo a transition in advance of the social relations of production in agriculture. This transition varied within mining as well, for in Britain the nature and organization of mining varied somewhat from mining on the continent, particularly toward the end of the feudal epoch.²

When studying the development of mining during the feudal epoch, one is immediately struck by what "appears" as the "non-feudal" character of its organization, particularly after the beginning of the twelfth century. In order to illustrate the nature of mining in the feudal epoch, discussion will emphasize the organization of the industry in terms of the property relations, and relations of appropriation, along with the techniques involved. Such discussion will cover the period from approximately 800 A.D. to 1500 A.D., although the selection of such dates is still somewhat of an arbitrary decision.³

In Chapter I, the feudal mode of production was basically equated with serfdom, which was characterized by an "exploitative relationship between landowners and subordinated peasants." Surplus, in either the form of direct labour, or of labour in kind or money was "transferred under coercive sanction" to the landlord.⁴ Further, as in other modes of production

involving the exploitation of class(es) there exists within the feudal mode of production an internal contradiction or dynamic associated with the class conflict between the producer (peasant) and the non-producer (landlord). Such a dynamic surrounded an increasing struggle over the extraction of surplus on the part of the landlords through rent. By striving to increase the extraction of surplus (feudal rent) the feudal landlords were attempting to "maintain and improve their position as rulers The maintenance of class power in existing hands, and its extension if possible, is the driving force in feudal economy and feudal politics. For this reason rent had to be maximized."⁵ In the struggle for maximization of rent there occurred changes in the nature of the class structure, and in the forms of rent exacted. Such changes in rent exaction, as Hilton (among others) demonstrates with respect to agriculture, led to a decrease of rent in labour while increasingly rent took the form of rent in kind or money.⁶ Similarly, such changes occurred in mining.

The development of mining within societies where the feudal mode of production predominated saw the productive relations change from what were essentially relations of slavery to forms which appear as precursors of wage labour, a central characteristic of the capitalist mode of production. In conjunction with this development there occurred fundamental changes in terms of the productive forces.

During the early period of the feudal mode of production in Europe, mining basically shared many of the characteristics it had under the Roman Empire. Under the Merovingians, mines were exploited by the use of slave labour--a period covering the seventh, eighth, and the opening of the ninth centuries.⁷ Such methods were unsuccessful, however, because of the low

productivity of the slaves and the low level of development of techniques. The source of such slaves came either from raids and plunder, or as a result of the punishment of crime. Such techniques resulted in a low level of efficiency and a substantial amount of supervision.⁸

Prior to the twelfth century, much of the mining was carried on by villeins or feudal serfs. As a serf, the miner "was tied to the land; he was liable for service to his lord; he gave part of his time to agriculture, his occupation as a miner was not specialized as yet."⁹ Under such arrangements, particularly with respect to coal, the serf might also take minerals from the manor in a similar fashion to the way in which he would draw wood for fuel; part of the production would go to the lord of the manor, constituting part of the surplus which was extracted from the production of the serfs. In certain circumstances the feudal princes worked mines with the use of serf labour, where the rent from the serfs was collected through labour in the mines.¹⁰ Mining, however, was still a rather primitive undertaking, involving little more than grubbing or shallow digging.

There occurred, however, in the twelfth century, a change in the status of miners as a result of the increased demand for revenue (surplus) on the part of the nobility. Whereas such an increase in the extraction of surplus resulted in an increased pressure on the agricultural serfs, in mining the king intervened directly between the landlord and serfs, resulting in the emancipation of miners. The nature of this emancipation appears to vary from region to region in Europe and England, but it was linked to a "fresh elaboration of the legal tradition of regalian rights" with respect to minerals in the ground.

The change in the status of miners in Britain occurred earliest in Devonshire and Cornwall, with such changes having a dramatic effect

on the development of mining.

In the twelfth century the tin-miners of Devonshire, who then were more numerous than those of Cornwall, were given special rights and placed under the jurisdiction of the mining courts, known as the stannaries. In Cornwall, also, the same privileges stimulated operations.¹²

In this period the custom of "bounding" was becoming established, having the effect of separating miners from ordinary agricultural labourers. Such custom had a drastic effect on serfdom as "the poorest villein could become his own master merely by pegging a claim and registering its boundaries (hence the term 'bounding') with the proper official".¹³ This official was appointed by the King and issued regulations which made the miners responsible to him in place of ordinary courts. In 1201 the "stannaries" received the added force of a royal charter by King John.

(This charter) by placing the miners outside the jurisdiction of the ordinary courts, they escaped finally from their feudal serfdom, and, ceasing to be villeins, became artisans. The charter states that the privileges are granted because "the tinnners are of our farm and always in our demesne". This is significant, for it indicates the idea underlying the momentous change in the miner's status: the King, by asserting his right to land on which ore had been discovered, claimed the discoverer as his own retainer, and thereby freed him from feudal obligation to his lord. Furthermore, the King, we may presume, decided to encourage mining as a source of revenue, and, for this purpose, he deemed it advisable to give the miners wider opportunity to search for the tin ore and exploit it without hinderance from their masters.¹⁴

While John was later forced to rescind the charter, Henry III restored the miners' rights and Edward I (1305) issued regulations further differentiating the tin miners from the rest of the community. In other regions of Britain, such as the Forest of Dean, the Mendip Hills, and in Derbyshire,¹⁵ miners obtained charters that confirmed similar existing customs.

In Germany, there developed in this same period a number of free cities associated with mining, whose residents were free from the constraints of feudalism:

The residents of such a city, if miners, enjoyed special privileges, including free brewing, and baking, immunity from taxation and military service, as well as exemption from the craft regulations that hindered workers elsewhere in the choice of an occupation The inhabitants of the free cities enjoyed the privileges of town law as well as of the mines; the city council came to exercise a large measure of power in mining affairs, and under cover of such protection the miners were enabled to organize themselves in guilds whereby they withstood the exactions not only of the lords, but also of those controlling the mines and smelters.¹⁶

This new status of miners likewise received similar recognition as had the miners in Britain, when the bishop of Trent granted a charter to miners in 1185, "by virtue of which all the miners in his domain were accorded 'the right of tarrying, laboring, and going and coming in the mountains, in the city, and wherever they might wish, freely and without hinderance'¹⁷ The shackles of villeinage were relaxed". Towards the end of the feudal epoch the miner is found in the position of an artisan as opposed to a serf, with the right to form guilds and societies for mutual aid, and benefit, and protection of those employed in mining. Such guilds appear to have developed to the fullest in Germany, where they took on the appearance,¹⁸ as described by Kuczynski, of a military organization.

Although the issuance of charters confirmed mining as an occupation and the miner as an artisan, at the same time there were occurring changes in the organization and technique of mining, as the free miners began to organize in various forms of association. The individual miner generally could accomplish little by himself, so some form of cooperation became

necessary. The earliest form of cooperation involved normally four, but occasionally more, miners working two shifts with one underground, and one on surface working the windlass and discharging the ore at the surface. As operations grew, additional men required for moving the broken ore, timbering and building ground supports and sharpening drill steel. Such requirements led to the organization of self-governing groups, such as the cost-book system that had developed in both Cornwall and Germany.

In Cornwall the 'adventurers' as they were called, most appropriately, numbered from four to thirty-two; they met every month, and received the accounts from the purser, or treasurer, after which they declared either a dividend or an assessment, according as a profit had been made or a loss had been incurred during the period under review. Any adventurer unwilling or unable to pay his assessment thereupon lost his share, or dole, but he was entitled to his proportion of the cash value of the machinery and materials, as determined usually by arbitration. The payment of the contribution might be enforced by the purser by appeal to the stannary court, which specifically exercised jurisdiction in Cornish mining affairs.¹⁹

This form of organization served as a model for later mining companies prior to the custom "of issuing scrip to share-holders in evidence of their proprietorships".²⁰ Such form of organization, however, soon encountered various difficulties, which gradually led to the loss of control of the mines by the miners' associations. One source of difficulty arose in relationship to smelting ore. As long as the ore was simple in character, the miners were able to smelt the ore themselves. However, the more complex ores necessitated the miners shipping the ore to smelting houses which generally belonged to the landlord or seignorial owner of the land, or else his concessionaire. As a consequence, the mining associates were often short on money needed for expansion or deepening the mine, as payments to the miners were normally made through the smelting-houses, while

charges for smelting were quite often on the high side.²¹ In Germany the miners usually had two alternatives available: (1) admitting members who contributed money rather than labour, and (2) leasing sections of the mine to outsiders on tribute, similar to the system developed in Cornwall and Devonshire. The result was that there developed a system of absentee ownership of the mines. "The mine associations, no longer connoting personal labor of its members, began to include non-residents of the mine-cities, and even capitalists living at a distance, such as merchants in the great trading centres."²²

The first practice has been referred to in one account as the cost agreement system, in which "an equivalent money subsidy" would be given²³ in place of labour. The development of the tribute system, toward the end of the thirteenth century, was a long, drawnout affair, arising out of the desire of the seignorial lords for increased revenue from the mines, and requiring the expansion of workings through the building of adits, shafts, and more sophisticated drainage systems. In order to induce the mining associates to undertake such work, the holdings offered to them were larger than they could readily work. Rather than expand the numbers of associates, and, lacking money with which to engage labourers on time or piece-work, the associates let out a portion of the mine to a company of labourers for a stipulated share of the profits. These tributers would²⁴ work their assigned portion at their own discretion. In letting a portion of the mine to a tributer, the mine associates, while still being the superiors of the tributers, remained under certain obligations to them.

As soon as the mine associates had given over a portion of their holdings to tributers they were bound to put the latter into a position in which to begin operations. To this end they must furnish a supply of rope and

leather, in order to free the mine from water. According to decisions of the mine court of bylaw, timber and carpenters must also be supplied together with horses and men to raise the ore. On the other hand the associates possessed rights correspondingly extensive, the general presumption always being that the tributers were their subordinates.²⁵

Such a system continued to exist in Germany down to the sixteenth century, but it was undergoing a transition arising from difficulties similar to those experienced by the early mining associates, i.e., difficulties in obtaining payment from the smelters, and excessive smelting charges, as well as the fact that the associations were undergoing a transition resulting in its inevitable disappearance.²⁶ It was out of the "depression of the poorer mine partners or tributers, to the position of laborers" that the development of journeymen's guilds among the miners in Germany grew; while on the other side the members of mining partnerships increasingly²⁷ were members who contributed money rather than labour. In Germany, by the end of the fifteenth century, mining was well on its way toward transformation into capitalist production.

A third form of organization developed also--known as the lease. By the lease system "an outsider might lease for a fixed annual sum part²⁸ of the territory of a mine association". Later, the lessees were relieving the associates of the whole mine. The lease system represents possibly the most developed transitional form to capitalist production since the lessee was a capitalist; therefore, discussion of the lease system will be undertaken as a part of the capitalist mode of production.

Similar forms of organization to those which occurred in Germany began to develop in Britain during approximately the same period; particularly in the lead-silver mining regions of Derbyshire, as well as in the

tin mining regions of Cornwall and Devonshire. The decline of these forms of organization did not, however, occur as quickly in Britain, where the tribute system lasted well into the nineteenth century--although the decline of the poorer miners, whether under the old associations, the cost agreement (cost book), or tribute, was brought about by similar factors²⁹ as those in Germany, that is, problems with the smelter-owners. The tin miners faced further difficulties from the sale of tin, which was under legal constraints associated with coinage and royalty payments. Tin could be sold after coinage officials had assayed, weighed and taxed, which occurred twice annually.

One result of the coinage system, by which tin might not be sold until stamped, and could only be stamped twice a year, was that the smaller tin workers inevitably fell into the hands of the capitalists. The small independent tinner, with no reserve of capital to draw upon, had almost always to pledge his tin in advance to the adventurers and tin-dealers, and as a result he was often worse off with his theoretical independence than he would have been as a recognized wage-labourer. The wage work system must have been introduced into the stannaries at quite an early period. Even in 1237 there are references to servants who worked the mines for the tinnerns. In 1342 certain of the wealthier Cornish tinnerns endeavoured to force their poorer bretheren to work for them at a penny a day, when they had been working tin worth 20 d. or more daily, and it is said that Abraham the tinner in 1357 was actually employing three hundred persons on his works.³⁰

A further aspect of mining during the feudal period which must be discussed is the relationship of the feudal lords to the mining interests (both miners in terms of occupation, and the later money partners in mining). It is in this aspect of mining that certain important differences existed between continental Europe and Britain. In Germany, mining was still heavily influenced by the local landlord or feudatory prince, although the miners were no longer subject to the feudal bonds like the

peasant serf. In intervening, the seignorial lords encouraged the introduction and expansion of the tribute system at the expense of the system of associates or partnerships. At times tributers were introduced into the mines without consulting the partners. The interests of the princes lay in expanding production, as they received a fixed proportion of production, usually ten percent, of the gross product of the mine.³¹ One result was the growth of "a small army of officials, . . . at or near the mines" to oversee and direct his personal interests.³² This involvement of German princes led Lewis to summarize:

Thus, although nominally in private hands, the German mines remained in reality quasi-seignorial undertakings. The companies were checked and guided on every hand by the lords' officers. This fact becomes more noticeably during the revival of mining, actively beginning with the fifteenth century, when the lords began either to take over the mines or to subsidize, directly or otherwise, the less prosperous. Once this change was made and the laborers hired, not by the company but by the prince's servants, the transfer of the mines to the state was wellnigh complete.³³

There developed in Germany a bureaucratic system "where even the methods of accounting were laid down by rigid rules and the contracts between mine associates and tributers, lessees, and hired labour filled out according to prescribed form".³⁴

Mining in England, in contrast to Germany, did not experience the involvement of feudal lords to any great extent, nor did the bureaucratic system of management develop to the same extent. In further contrast to Germany, it appears, as Lewis and Rickard suggest, the English monarchs were much more successful in establishing "regalian rights" over mines.³⁵ By these rights the monarch placed the mines under his/her control, and out of the control of the local landlords and feudal barons. While such

regalian rights were normally equated with possession of gold and silver mines, the English monarchs managed to extend such prerogatives to other metallic mines, i.e., argentiferous lead mines in various parts of England,³⁶ and tin mines in Devonshire and Cornwall. As Lewis later points out, however, such involvement was mainly indirect, and generally done under fiscal considerations:

(Mining) was not an affair of the state, but primarily of individuals. The state, indeed, opened the field to all comers, and endowed the mining classes with certain privileges for which through special taxation it made them pay roundly. But apart from the necessary safeguarding of its fiscal interests, it did not interfere with the private management of the tin mines, nor did it attempt to work them itself.³⁷

Similar payments were generally owed to the feudal landlords of the land on which ore was found. The feudal landlord could not, however, interfere with the mining operations, except as prescribed under the royal charter respecting mines; while the amount of the landlord's royalty was also set³⁸ down in the same charters. In England, while similar forms of organization existed to those which were developing in continental Europe (that is, the cost agreement, tribute system, and lease system), the mines appear not to have been under the direct influence of either the monarch or the feudal landlords.

A final aspect which must be examined involves the nature and development of the forces of production within the feudal mode of production as it relates to mining. As indicated earlier, mining, when it involved the use of serf labour in the landlord's mines, was little more than a grubbing affair, with a low level of innovation and technological development.³⁹ No elaborate drainage and hoisting systems existed, generally. With the development of mining as an occupation, and the emancipation of

miners with the corresponding development of miner partnerships, there was a coincidental development of productive forces. The partnerships brought together skilled miners, both requiring and enabling the miners to apply their skills. As the mines were deepened and expanded, more partners were engaged, resulting in the further extension of the division of labour (generally around skill). The expansion of productive forces also introduced agencies of change, however. The requirement of elaborate equipment associated with the deepening of mines required partners who contributed money rather than skill or labour, and eventually led to the transfer of the partnerships (associations) to non-miners.⁴⁰ Toward the end of the feudal epoch (in the sixteenth century), the development of the productive forces was at a level beyond the means of the labour contributing partners, and while such associations (partnerships) may have continued to exist, mining and metallurgy also involved elaborately engineered machinery of a nature⁴¹ described by Agricola.

In summary, then, mining within the feudal mode of production underwent changes as the various feudal landlords attempted to extract more surplus through expansion of the mines. Such changes led to a transition in the relations of production, which initially were extensions of the serf relations in agriculture; the direct labour of the serfs being put to use in the mines of the feudal landlord. In the struggle for increased surplus extraction the use of serf labour was replaced by partnerships of miners, such as the cost agreement. While the miners had the right to mine on most available land, they did not have full title to such land, title remaining with the feudal landlords, or as royal demesne. The right to mine carried with it the obligation to undertake mining within a certain

stated period of time, and the payment of specified percentages of production to the landlord and the Exchequer. Under arrangements such as partnerships and cost-agreements, mining became an occupation and the skilled miner an artisan similar to the guild craftsmen of the cities. While the miner had possession of the mine, however, legal ownership still remained with the feudal elements.

Mining underwent further change as the exaction of surplus on the part of the feudal landlords increased, with forms of organization developing which were of a transitional nature, and representative of the incursion of capital in an "embryonic form". The introduction of the tribute system represented a further transition in that the tributers had no claim to the ore in the ground above a certain percentage of the value of production over a specified time period, as agreed upon by contract with the landlord, and later, mining associates. Further, the feudal landlords, particularly those in areas where the re-establishment of "regalian rights" or "mines royal" was successful, facilitated the entry of "capital" into mining by pledging the mines to creditors, occasionally turning the management over as well. The use of mines as "collateral" generally occurred under the guise of the lease system. The development and expansion of mining under the feudal mode of production brought about forces leading to a transition toward the petty commodity mode of production, and more commonly, toward the entry of the capitalist mode of production into mining.

Mining as Petty Commodity Production:

As illustrated in the previous section, while miners during the feudal epoch were similar to the artisan guilds, mining, with relatively few exceptions, did not develop fully into petty commodity production, due

in part, to the need for miners to form partnerships in order to undertake production. There did exist, however, mining in the petty commodity "form" or mode independent of the feudal mode of production; mining in a "form" similar to what O'Connor has described as independent commodity production. In order to clarify the discussion, it seems appropriate to backtrack to earlier discussion on petty commodity production, examined in Chapter I.

The development of the mode of petty commodity production takes place in conjunction with the transition from feudalism to capitalism. The appearance of petty commodity mode of production, it was argued, varied, depending on the particular historical conditions in which the intermediate, or petty, commodity mode developed. The development of a petty commodity mode in Europe occurred in the context of the development of capitalism out of feudalism. The petty commodity producers, in essence, were caught in the middle between the feudal lords and developing capitalists. The full development of such a mode, it was noted, required that the petty commodity producer "must be free from constraints arising from other modes". It was in the United States, as well as in the British white settler colonies, where the petty commodity mode was least constrained, and developed to its fullest. The discussion of mining in terms of petty commodity production involves, therefore, two parts: the first deals with its development in Europe in the context of other existing modes (the feudal and capitalist modes of production); secondly, mining will be discussed in terms of "independent commodity production", such as it developed in certain regions of the United States.

The nature of petty commodity production associated with mining, like the artisan guilds, involved a relatively low-level of technological

innovation, and a small amount of equipment. With the emancipation of miners from the bonds of serfdom, mining in certain regions of Europe developed in "forms" representative of petty commodity production, although the miners were not completely free from the constraints of feudal society. The early forms of organization arising with the miners' emancipation, such as partnerships, and early developments of the cost-book system, were initially representative of petty commodity production in mining, in that producing units were small, usually involving four to eight men. With the expansion of the partnerships and cost-agreements resulting in an extension of the division of labour among the miners, and with the entry of partners who contributed money instead of labour, such forms of organization were becoming transformed into types associated with the productive relations
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of the developing capitalist mode of production. There continued to exist, however, mining as petty commodity production, in which the requirements for equipment to undertake mining remained relatively small. In Europe mining of this nature could be found in the mining of alluvial ore deposits such as among certain of the Cornish and Devonshire tin miners. The importance of such mining becomes even more significant with respect to the development of placer mining and petty commodity production in the United States and in British white settler colonies.

The development of the alluvial tin deposits in Britain occurred prior to the exploitation of tin lodes. Much of the tin mined, even toward
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the end of the feudal epoch, came from such deposits. The methods of working these deposits were somewhat primitive, as is described in the following excerpt, but they continued to be in use and were adapted later for use in the mining of placer gold deposits in North America and Australia.

The extraction of alluvial deposits is called streaming, and is usually far simpler and cheaper than mining--furthermore stream tin is invariably of superior quality to mine tin. After determining the approximate location of a deposit, usually from outcrops of tin stones called 'shode', prospectors would generally sink a series of shafts or hatches to depths of perhaps twenty to forty feet in order to survey accurately its richness and extent. Having decided to work the ground an open trench was first dug down to the deepest part of the valley to carry off the water and waste from the working, and then the overburden of stones and earth was removed. Water was crucial to streaming: it was sometimes used to remove the overburden after it had been loosened and it was essential in the sifting of ore from its accompanying debris, called by the tanners 'gall, wundirk and dawegard'. Frequently streamers had to divert water considerable distances overland by means of conduits made of turves and wood, and sometimes the course of a river would even be altered. A stream work 'without water is like a windmill without wind' and long dry spells usually brought operations to a halt.⁴⁷

Mining deposits of such a nature required relatively little equipment, but a fair amount of manual labour was involved in excavating overburden. "Operations of this nature necessitated no miners' associations or minute division of labour Often a single Cornishman, aided possibly by his son, could manage a stream work."⁴⁸ Mining of this character was not always a full-time occupation, but was combined with other means of livelihood. Many miners were migratory workers who spent part of the year farming or fishing. Further, full-time tanners "usually kept a few animals on land close to their tin work, and many cultivated land as well".⁴⁹ The existence of small producers was quite extensive, as Lewis illustrates with regard to production totals based on coinage account roles of the stannaries. As an example, he cites the figures for tin production in Devon for the year 1302:

Out of one hundred and thirty-four men, one hundred and nine produced less than a thousand-weight each; sixteen from one to two thousand; seven from two to

three; one from four to five; and one from nine to ten The same story might be repeated for almost any year in either county, the significant feature being the great number of men whose income from tin must have been exceedingly small.⁵⁰

While many of the tanners were essentially petty commodity producers, the question arises as to what their relationship to the surrounding feudal and "embryonic capitalist" elements are. An added burden on the petty commodity producer who was associated with mining was a number of forces which affected the transition of mining from essentially feudal relations of production through petty commodity production and eventually toward capitalist relations of production. As mentioned earlier, there existed a need for some form of organization between the free miners, in order to undertake production, particularly when production switched to lode from alluvial mining. The struggle within the feudal mode of production surrounding the increased exaction of rent, which led to the emancipation of miners, continued, however, to influence the "free" miner as a petty commodity producer. The small producer, like all producers, could only sell tin twice a year, a burden which was only alleviated by the ability of the petty producer to undertake other occupations. Such regulations, as already illustrated, tended to favour the large producers. The continued existence of petty commodity producers, however, was possible within the area of stream works, although even these miners were affected by such

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legislation.

The mines started, it will be recalled, under the entire charge of several or even of one working adventurer, This primitive type of organization always maintained a certain standing. The bailiff of Blackmore refers to it. Carew mentions it in 1602; Jors in 1765 and Pryce in 1778 distinctly state that this type existed in their times, although becoming somewhat rare. We may go a step farther and

say that the working adventurer still survives, here and there, although by the nineteenth century, if not earlier, he was confined to stream work.⁵²

If the petty commodity producer in European mining was under continual pressure from the feudal and developing capitalist elements, it was in North America, and to a lesser extent in the British white settler colonies, that the miner as a petty commodity producer, or artisan, developed to the fullest. O'Connor, in using the term independent commodity producer, was referring to the petty commodity mode of production in a particular historical context. The petty commodity producers, after the American Revolution, were independent producers, and like American capital, "did not have to confront or deal with the remnants of either feudal superstructures or mercantilist states".⁵³ Rather, at least initially, the petty producer and developing capitalists shared common interests.

The power of the petty producers was manifest after the Revolution in the form of the liberalization of land acquisition and pressure on state governments to build canals and railways I quickly add that land speculators, merchants, bankers and others in the ruling class also supported these measures for their own reasons. But the independent farmers, artisans, teamsters, small traders, etc. (i.e., the class which produced values as opposed to the merchant/banker class which merely realized values), also supported them.⁵⁴

Both groups, O'Connor later points out, "shared a passion for land", and hence both "modes of production were imperialist in the older and traditional sense of land-grabbing".⁵⁵ O'Connor further adds, that the interests of capital and petty producers in land were opposed.

The capitalist wanted land not only as a means of production (and means of production of surplus value), but also to make available the labor power of the people who worked the land (or the immigrants and settlers who might work the land). . . . Capital needed the land to expropriate the farmers and create a labor surplus, which Marx rightly saw as the key to capitalist development.

The struggle between capital and the petty (independent) producer was,
 therefore, over control of the labour power of the petty producers.⁵⁶

It was a struggle that not only eventually undermined farmers, but petty
 producers of all sorts--artisans, teamsters, builders, and small business-
 men.⁵⁷ Mining in the United States was also influenced by this struggle
 for mining, particularly in the pre-Civil War period, involved a number
 of such independent producers.

The importance of the petty producer in early North American min-
 ing has, needless to say, been immortalized in California, the Cariboo, and,
 later, the Alaska-Klondike gold rushes. Prior to this period, however,
 there existed numerous petty producers throughout the United States. The
 development of lead deposits in Wisconsin was by petty producers of Cornish
 background, as well as by emerging capitalists. Under the system of leases
 existing in the United States at that time (1840s and 1850s), little cap-
 ital was needed to initiate lead mining, since the price of the lease was
 a percentage of the ore raised; the ore normally being extracted by rather
 simple mining methods.⁵⁸

While petty producers made some inroads in lead production in the
 Mississippi Valley, it was in placer mining that the petty commodity prod-
 ucer was most successful. In organizing their operations, the placer miners
 formed partnerships similar to those formed by the "free" miners in Europe
 toward the end of the feudal epoch.

At first the digger worked singly, but he soon found
 it more convenient to have a partner, not only for
 company but because the lone man was economically a
 misfit. Usually one man shoveled the gravel while
 the other washed it in the cradle or rocker. As the
 workings increased in size it became necessary to
 operate in parties of four or more. Thus larger and
 more lasting partnerships were formed.⁵⁹

While undertaking operations of this nature, the miners developed codes or mining "laws" which reflected the traditional rights of the miners of Germany, and in the stannaries of Cornwall and Devonshire. Such a development occurred in California for, at the time of the gold rush, federal laws with respect to mining rights were "local in their incidence, and applied only to particular lead and copper districts in Missouri, Michigan, and adjacent mid-western states".⁶⁰ Because of the absence of such regulations regarding gold mining in California, and the inability of federal authorities (the military) to expel the miners, there resulted the development of mining and mining rights based on the past experiences of the miner. Such local rules later became substance in the mining law enacted in 1866 in the United States.⁶¹

The right to locate a mining claim, and to hold it against all comers, until abandoned, was generally admitted. This basic idea of mining law had been brought by the adventurers to California from other lands; it was the traditional right of the miner, as much in the seven mine-cities of the Harz as in the stannaries of Devonshire and Cornwall. Title, it was agreed tacitly, was derived from the first locator, and continuity of work sufficed to maintain persistence of ownership. This simple code was established by mutual agreement of the diggers in meeting assembled, and by their willingness jointly to use force in support of any comrade that might suffer wrong from a trespass on his claim. The size of it, from thirty to a hundred feet square, was established in the same manner, a modification being made in accordance with the character of the deposits, for some of them necessitated a larger area, in proportion to the scope of operations, the amount of preparatory expenditure, and the number of men needed to conduct work on a suitable scale. Each man had his say, any man was as good as another, and the rudimentary community accepted the decision of the group as final. Thus was the organization of the mining-camp evolved.⁶²

Although petty commodity producers developed within such a context, they encountered forces which eventually led to their decline. Like the

"free" miners of Europe and Britain, the independent commodity producer as a miner faced the problem of increasing technological development associated with the exploitation of placer deposits. At first such requirements could be met within the system of simple partnerships which developed; partnerships involving four or six members, and through whose labour much of the larger equipment (for example, sluice-boxes, flumes, and other wooden construction, as well as ditches) could be built. The "capital" required for the larger hydraulic operations, such as associated with the deeper placer deposits was, however, beyond the capabilities of most "free" miners. 63

While the "free" miner encountered the problem of increased technological requirements as the more easily exploitable placer deposits became depleted, there also existed the relationship between the petty commodity producers and the developing capitalist class. Just as O'Connor has argued in regard to the small farmers, artisans, teamsters and other petty producers, the "free" miner was coming, increasingly, into conflict with the capitalist interests in mining. This was evidenced by the development of mining laws and regulations. Although the initial measures passed in 1866 by the United States reflected to some extent the development of mining regulations in the gold camps of California, later Acts reflected the decreasing power of the "free" miners. 64 The Acts of 1870 and 1872 increased the size of lode claims to "1500 feet along the vein and 300 feet on either side" and made allowances for extra lateral rights (the right to follow dips, spurs, and angles in the vein). Similarly, placer claims were set at twenty acres, about the same area as the lode claims. Such claims were much larger than the traditional placer claims of the mining camps as originally developed by the "free" miners. However, such larger mining claims provided a better

basis for exploitation by capital. The position of the petty producer was further undermined by the change, and later the discarding of the idea of "continuous development" in mining regulations, an idea originally contained in both Australian and American mining regulations.

The basic principle of the Australian law is that a mining claim shall not be held without continuous development; if one man does not work the ground, another shall have the opportunity to do so. Such was the fundamental idea among the Californians also; it was a corollary of the one-man one-claim postulate, which however, was set aside on the American goldfields when the use of capital became a dominant factor in mining enterprise and the owners of mining property began to hire others to do their work. This led, in the United States, to the holding of several claims by one person and the substitution of an amount of work of given value (\$100 per annum) in lieu of the labor formerly required from the claimholder himself. Thus a rich man could own a number of claims without working on any of them personally. Absentee ownership became a fact.

Next, and worse, the original idea of continuous development was discarded altogether when the American law permitted the claimholder to acquire title in fee simple to the ground by spending \$500 in developments and improvements, and by paying \$5 per acre of lode-claim, thereby obtaining a 'patent' to the property The patent gives absolute ownership, even as against the Government, and permits the owner to cease work entirely at his pleasure, whereas the lease leaves the claimholder under the obligation to perform a fixed amount of work annually. So the American system is safer for the capitalist, but it has the obvious defect of alienating parts of the public domain permanently, and of allowing the ground to pass into the hands of persons that may hold it unproductively.⁶⁶

The development of the petty commodity mode of production within mining, it has been argued, occurred in the context of a transition from the feudal mode of production to the developing capitalist mode of production. In Europe, the petty commodity mode occurred under the domination of the declining feudal elements, and never developed to its fullest as the petty commodity producers were never free from the constraints of other

modes of production. On the other hand, the petty commodity mode of production in North America, particularly the United States, did not encounter the encumbrances of the feudal mode, but rather developed in a situation of comparative independence, since the capitalist mode was only in an early, formative period. Such producers, however, eventually succumbed to the onslaught of the expanding capitalist mode of production. It is to the question of mining and the capitalist mode of production that discussion will now shift.

Mining and the Capitalist Mode of Production:

With the expansion of mining within the feudal mode of production, and with the later emancipation of miners, the pre-conditions for the development of mining within the capitalist mode of production were coming into being. The development of the capitalist mode within mining did not occur simultaneously with the growth of "free" miners, but came about through a period of transition, with capital becoming involved with mining at a relatively early date during the decline of feudalism. In continental Europe, among the early capital interests involved in mining was the merchant house of Fuggers, starting particularly with Jacob Fugger.

For a time he and his brothers followed the old plan, of trading in silks, woolen, and spices, but presently Jacob entered upon the more profitable business of exchange and mining. At that time most mines were crown property, and they constituted the best security that kings and princes had to give in pledge for monetary aid; therefore a money-lender became in due course a mineowner; it was the simplest way for an enterprising merchant to acquire the ownership of important mines. For example, in 1478, as security for a loan of 23,627 florins to the archduke Siegmund, Jacob Fugger obtained control of the silver mines of the Black forest. Next year, for 15,000 florins the Fugger brothers secured the grant of the entire yield of these Schwarzwald mines until repayment of the entire debt. This, in

the opinion of the business community, being considered a good bargain. In 1495, as part of an extensive speculation in copper, they, with other firms at Augsburg, organized in 1498 and 1499, a syndicate for cornering the Venetian market in that metal.⁶⁸

Later members of the Fuggers family continued financing feudal princes, such as Phillip II of Spain. As security against such loans to the Spanish monarchy they received possession of the silver mines of Guadalcanal and
⁶⁹
In 1598, the Almaden quicksilver mines.

Similarly, in Britain the King pledged mines in Devon and Cornwall to his creditors, an example being the lease "which Edward I in 1249 made over a Devon mine . . . to Coppus Josephus and various other financiers of
⁷⁰
the Florentine company of the Frescobaldi". The lease contained eleven clauses covering the operation of the mine, supply of labour, equipment and provisions, the rights of the lessees and miners, taxes and tallages, and the remaining rights of the king. The lessees were under the protection of the king, just as the miners were answering only to the court "of the Treasurer and the Barons of the Exchequer". The lessees essentially were the same as the other miners within the stannaries. In the operations of the mine, the lessees were not totally outside the power of the king, but rather operations were of a more joint nature. Both the king and the
⁷¹
lessees had a hand in the management of the operations.

While merchant and banking houses accepted the mines of the feudal princes as being pledges against credit, such transfers did not simultaneously turn the mines into capitalist operations for the involvement of such capitalists was generally of a passive nature. The development of the capitalist mode of production in mining involved a transformation of the labour process, as well as the social relations of production, and not

the simple transfer of surplus based on rent, normally exacted by the feudal princes, to the merchants and financiers. Mining in terms of capitalist productive relations, therefore, involved the gradual transformation of miners into a proletariat and the labour process becoming the responsibility of the non-producer (capitalist). Such a transformation may be better illustrated by reference to the transition of mining in Britain into capitalist productive relations.

The transition from the feudal mode of production to the capitalist mode, it was argued by Marx, followed two paths. On the one hand "the producer becomes merchant and capitalist", a path which Marx sees as the revolutionary form of transition.⁷² As Dobb later demonstrates, such a transition can be "associated with the rise from the ranks of the producer themselves of a capitalist element, half-manufacturer, half-merchant, which began to subordinate and to organize those very ranks from which it had so recently risen".⁷³ Secondly, the merchants took direct control over production. This tendency, however, "cannot by itself contribute to the overthrow of the old mode of production, but tends rather to preserve and retain it as its precondition"; it does not revolutionize the mode of production but acts as "an obstacle to the real capitalist mode of production".⁷⁴ By the second tendency the merchant turned "the small masters into his middlemen, or (bought) directly from the independent producer, leaving him nominally independent and his mode of production unchanged".⁷⁵ One can find within mining the evidence of both aspects of transition. In order to comprehend the nature of mining in terms of the capitalist mode of production, discussion will emphasize, on the one hand, the property relations and the transition by which the capitalist mode became predominant within

mining, and, on the other hand, the transition within the labour process, with the gradual formation of a proletariat associated with mining.

The development of a proletariat associated with mining occurred through a method somewhat "less obtrusive than the classic English method of eviction and engrossment of farms as a policy initiated from above".⁷⁶

It consists of the tendency to economic differentiation which exists within most communities of small producers unless special institutions prevail which are capable of preventing inequality. The chief factors of this differentiation are differences that arise in course of time in the quality or quantity of land-holding and differences in instruments of tillage and of draught animals; and the agency of eventual dispossession is debt.⁷⁷

While Dobb, in the above statement, refers to agricultural production, he is also referring to a situation in which free land could have existed, but "other factors such as debt or monopoly may rob the small producer of his independence and eventually occasion his dispossession".⁷⁸

The development of the petty commodity mode of production associated with the emancipation of the feudal miners into "free" miners provided the basis for such a transformation of miners into a proletariat.⁷⁹ Initially, as illustrated earlier, the "free" miners were essentially petty commodity producers. Such producers, however, faced a number of forces which eventually affected the transition to the capitalist mode of production. Among the forces which possibly served as the foundations for the growth of a small group of well-to-do miners from out of the ranks of the producers, were differences in the ground, with a few miners having had the fortune of staking out good diggings, and thus they possessed a significant advantage. But, as Dobb illustrates, such differences "could hardly have formed the basis for a class differentiation", so long as "new diggings were available and access to them was free".⁸⁰

So long as self-employment was open to all, the basis for a class of persons who were willing to labour for others because they lacked any alternative was absent. These differential advantages may have formed the ground for the growth of a small kulak class; but had it not been for the impact of external forces, inequalities would probably have remained relatively small and the free mining districts would have retained their character as fairly homogeneous communities of not very sharply differentiated small producers.⁸¹

It was from the declining feudal and developing capitalist mode of production that the external forces upon the "free" miners originated. In the earlier discussion it was argued that the dynamic associated with the decline of the feudal mode was the increasing exaction of surplus on the part of the feudal ruling class in order to maintain its position as the ruling class. While the development of the "free" miner arose with this increased demand to surplus, so too did the undoing of the system of "free" miners. The feudal landlords, in order to increase their revenues, intervened indirectly, and occasionally directly, into the operations of the mines, and thereby depriving the "free" miners of much of their independence.

Of the important influences, one of the major sources of difficulty⁸² for the petty producer ("free" miner) involved the smelting of his ore. In order to ensure the collection of royalties, the feudal kings or princes either required that the miners' ore be smelted at the landlord's smelting-house, or else he let out a monopoly concession on smelting. In either case, the miners had no control over the smelting of their ore, since they tended to be short on money because of the slowness of payment, while smelter⁸³ charges tended to be exorbitant. This relationship between the miners, smelter-owners, and feudal landlords had, in the stannaries of Cornwall and Devon, further constraints on the producer since the sale of tin was⁸⁴ confined to two days out of the year.

In order to contend with the disadvantages of such arrangements, in that the "free" miners who contributed labour in the partnerships generally lacked the finances to expand, or even continue operations, the partnerships developed into a system of cost-agreements.

What seems to have been of crucial importance, if only as the initial wedge of a series of disrupting influences, was the rise in the fourteenth century of the so-called "cost-agreement" system, under which one of the associates of a mining group was excused from actual labour in return for a monetary payment.⁸⁵

As Dobb and Lewis further illustrate, despite regulations and laws to the contrary, many of the claims and shares in the partnerships went to individuals other than miners, for example, local gentry, clergy, merchants,
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and artisans.

In the coinage rolls we may also note the ownership of tin by persons who evidently could not have worked the mines with their own hands and among whom some at any rate were probably owners of mines or shares rather than mere purchasers of ore. For example, we find that John the mercer presents five hundred-weight; Henry, Earl of Devon, one hundred-weight; John, Earl of Cornwall, ninety-four thousand-weight; Thomas the goldsmith; four thousand-weight; while Richard the smith, Thomas the pewterer, John Trenagoff the clerk, Michael the skinner, John vicar of Bodmin, Ralph the rector of the church of St. Ladoce, Ralph Doly the clerk of Lostwithiel, Joanna the widow of Ralph Barson, Ralph the chapman, John the merchant, Philip the prior of Tywardratch, and Alfred the prior of Mt. St. Michael, all figure in the lists. Some of these "tinnors" were women, others churchmen, others small tradesmen and artisans.⁸⁷

While the cost-agreement may have been the "initial wedge", there developed as well other "disrupting influences" in the form of tribute system and lease system; the first associated with the transition of the "free" miners into a proletariat, while the second involved the entry of capital into mining.

The tribute system, described by Dobb as a "half-way house to the wage system", represents the earliest of a series of varying forms of

organizations which the labour process passed through as the capitalist mode of production penetrated mining.⁸⁸ This system, in turn, was followed by various forms of sub-contract such as tutwork, binding, and butty systems, then wage-labour. The tribute system arose as the owners of claims, either "free" miners or associations of them, caused either by their inability or unwillingness to work the claim to the fullest, would let out a portion and occasionally the whole mine, to a group of workmen for a share of the product.⁸⁹ The development of this system varied throughout Europe. While it developed toward the end of the feudal epoch, the decline of the system itself varied, particularly within Britain. Whereas in Germany the tribute system had for-all-intents and purposes, disappeared by the sixteenth century, it was to continue down to the nineteenth century in Cornwall and Devon.⁹⁰ However, the system, as Lewis describes, underwent a transition as the tributer, by the mid-eighteenth century, had become a small master who took the pitches under contract, having under them hired labourers.

The tribute system, as we had occasion to see from an examination of ancient stannary law, was probably an early development in the stannaries, and had become extensively employed by the time that Beare was writing his account. But just as might have been expected, these tributers had become by 1756, how and when we do not know, what some of the non-working mine partners were already, small entrepreneurs with hired labor. Even then however, the common miner, possibly under the steadying influence of the Wesleyan movement, had begun to improve his position, and we find him, probably in the latter part of the eighteenth century, superseding his erst while employer and taking the tribute system for his own use.⁹¹

As Lewis illustrates, however, there occurred a counter-tendency as the hired labourers began to take out the tribute contracts themselves, so that in the nineteenth century, prior to its disappearance, the tribute system is of a nature described in the following account.⁹²

Working places were let out on a contract basis and put up to auction each month. The contract was taken by a 'pare', a group which might vary from two men to a dozen or more; while it lasted the pitch was formally their own. (Miners who had been allotted a profitable place would hang on to it for as long as possible, at the same time trying to conceal its profitability from the 'captain' by holding back some of the more valuable ores.) The tributer, who contracted for the ore-getting pitch, was not so much a wage earner as a small-scale prospector renting the temporary use of a pitch; he was paid according to the value of his lodes--in proportion to profits and results; a lucky strike would put him temporarily in the clover (but only temporarily, because if a place proved profitable its price at the auction would be raised.)⁹³

Tribute work eventually gave way to tutwork, and in time, wage labour.

This transformation was induced, it appears, mostly as a result of an increased knowledge of both mining methods and the geological nature of lodes on the part of mine agents and captains, allowing for better estimates of yields. In turn, this removed much of the speculation associated with

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the tribute system.

While the tribute system lasted into the nineteenth century in the stannaries of Cornwall and Devon, it declined at a much earlier period in Germany, while never appearing to any extent in the other regions
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of Britain. Its decline in Germany was attributed by Lewis to a combination of an "increasing disparity in bargaining power between the two powers concerned" (tributers and mining associates, who in time were no longer labourers), and the problems associated with the smelting of the ore. As a result, the tributers were in severe economic straits since they "by the provisions of the law itself, must be dependent solely upon the work of their hands. Even peasant folk were not as a rule admitted to tribute, at least under any but the shortest of contracts, the rule being that the tributers must be those who besides their personal labor could contribute
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little or nothing".

With the decline of tributing, in its place there developed systems of piece-work. In other areas the poorer of the "free" miners eventually became piece-workers. Throughout Britain there developed various forms of piece-work, from tutwork in the stannaries to various forms of piece-work based on tonnage, such as developed in the coalfields and the lead mines of Derbyshire and in the Mendips. Tutwork, which, increasingly, replaced tributing as the predominant form of work in the stannaries during the nineteenth century, developed initially with respect to the preparation of the mine.

On the setting day the men employed in the mine, together with those who have come from elsewhere desirous of work, assembled around the account house or a platform where the chief agent or captain takes his stand. He reads the rules under which the mine is to be worked, and then auctions off the different pitches or pieces of work in the mine to the lowest bidders, who in this case represent small groups or companies of from two to eight men or boys (generally termed a 'pare' or 'pair'--W.M.). When these groups of men go to work together, they are charged for the material they use, the tools, candles, powder, and other necessities, as well as for the cost of hauling the rubbish to the surface. At the end of the period for which the contract is let a balance sheet is prepared; they are credited with the amount of work they have done and debited with its cost, and frequently also with a subscription for medical attendance, and the maintenance of a club, which supplies them or their families with aid in case of accident. Sometimes these tutworkers are in addition credited with the small percentage of ore that may be extracted in the course of their operations, in order to induce them to keep it as separate as possible from the rubbish, or "deads", and during the progress of the work they frequently receive payments on account.⁹⁷

Tutwork, like tributing, placed certain obligations on the contracting 'pares', such as the responsibility for supplying the necessary equipment rested with the contracting miners. Similarly, in other forms of piece-work, regulations of this nature applied.

Throughout Britain other forms of piecework existed. These systems, however, shared the same basic method of payment--either by the fathom, or by the weight, while in a few cases men were "paid by piece according to the different classes of work", while the work was generally contracted out such as in tributing.

The period of the development of wage labour in mining is difficult to delineate; however, Lewis illustrates that in Germany wage labour based on time, along with piecework, was replacing the tribute system at about the end of the fifteenth century. While wage earners were well in evidence in Germany, the entrance of wage work in the tin mines of Britain, although occurring at an early date, played only a secondary part to the tribute system. It was only in the nineteenth century that the wage system made any inroads into mining, as the tribute system was increasingly being replaced by tutwork, and tutwork drifted toward time work.

The entry of capital into mining, like the development of a proletariat, was the result of a number of forces, which led to the decline of "free" miners; forces that included the "embryonic" forms of capital. In the discussions on feudalism, it was illustrated that one of the initial ways of entry of capital was through the transition of the miners' associations, as partners who contributed money instead of labour began gradually to replace labouring partners, such as was the case in cost agreements. However, while non-labouring partners were becoming more and more predominant in the cost-agreement as the status of labouring partners declined, such non-labouring partners did not necessarily become directly involved in the management of the mines, although some maintained agents in the vicinity of the mines in order to safeguard their interests.

While the entry of capital into mining was facilitated by the cost-agreement, other forces existed which had an impact on its entry, such as the development of the lease system, as well as the role of the smelting-houses, and of metal merchants and other middlemen.

The lease system shared certain similarities with the tribute system in that both arose with the impetus of the feudal landlords' attempts to exact more wealth from the mines. Similar to the tributers, the lessee could lease part of the mining associates' territory for a fixed annual sum. Once crucial difference existed, however. ". . . whereas the tributers were poor men who did their work, and paid a contingent rent only, the lessee was a capitalist."¹⁰⁵

If the associates lacked the means to develop their holding, they surrendered a part to a man of wealth and enterprise, who in return for a fixed yearly rent was given the right to develop the area with the labor of his employees. Paying as he did a fixed rental, he incurred a risk beyond that of the tributers, and therefore received a correspondingly higher profit. This continued until in the course of time we find the lessee taking on more and more the character of a captain of industry, relieving the associates of not merely a part but of the whole of their claim.¹⁰⁶

Such leases occasionally were let out directly by the monarch, as in the previous illustration of the Frescobaldi and the Fuggers.¹⁰⁷ The granting of leases, and later monopolies and other concessions, continually plagued the "free" miner.

The effect of the relationship of the smelter owners to "free" miners on their development has been mentioned before. Not only was it, as Dobb mentions, a "factor which completed the transition" of the "free" miner into an eventual wage-earner, but smelter operators were becoming¹⁰⁸ involved in mining. In Germany, and in parts of Britain (Forest of

Dean and the Mendips) the smelter owners had monopolistic rights "rooted in concessions to build smelting works which were purchased from the seignorial lords", with such rights generally originating in the fifteenth century. By the end of the sixteenth century the smelter owners were in a position of dominance over the "free" miners as monopoly of sale also resulted in the smelter owners becoming middlemen. ¹⁰⁹ While smelter-owners may have had a monopolistic position with regard to the "free" miners, mining associates, and tributers, this relationship between the mining parties and smelting-houses was essentially that of merchant capital; the smelter operators having control over mining strictly through a monopoly on the purchase and sale of ore. In Cornwall and Devon, unlike the rest of Britain, there existed at a relatively early period middle-men or tin dealers, in appearance by 1198. ¹¹⁰ Such tin dealers generally purchased the tin from the miners after they had it smelted. The tin smelter-owners smelted the ore for a percentage of the tin and the smelter operators were organized similar to mines, through piecework and subcontract. There began in the seventeenth century, however "the transformation of the smelter into a capitalist, and the identification of the smelters with the tin dealers"; ¹¹¹ such a transformation coinciding with the abolition of the coinage system. This type of relationship appears to have lasted at least until the end of ¹¹² the nineteenth century. As was true elsewhere in Britain, there existed a relationship of the nature of merchant capital between the smelters and mining in Cornwall. Occasionally the mine owners would attempt to overcome the monopolies established by the smelter owners, as occurred in the eighteenth century in Britain with respect to copper production. Unable to overcome the hold of the other smelters, however, this effort eventually

fell through and its backers, among whom was John Vivian, founder of Vivian and Sons, joined the ranks of the other smelter owners in maintaining a monopoly over the buying and selling of ore.

The development of capitalists associated with mining involved either a process through which miners' associations were transformed from partnerships involving labour contributing members to organizations in which members contributed money rather than labour; or, secondly, through the system of leases, whereby the owner of the mining claim(s) (either mining associates or the state) leased the property to either an individual capitalist or a group of capitalists, usually with a joint-stock company being formed on the granting of a lease. The lessee(s) worked the property, using hired labour under various forms of contract (that is, tribute, tutwork, piece-work, time-work, etc. . . .). The relation between the smelters and mining, and metal dealers and mining was of the nature of merchant capital for both parties (smelter owners and metal dealers) exercised control over the purchase and sale of metals, particularly with respect to the smaller producers, rather than directly intervening into the productive process.

With the development of the capitalist mode of production within mining, not only was the miner increasingly transformed into a wage-labourer, but the conditions of his labour changed. Such changes occurred in association with the expansion of mining and the application of increasingly higher forms of technology in order to undertake expansion. The relationship between technology and the development of the capitalist mode of production in mining is, to say the least, a complex one. Not only was technology a factor in the transition from the feudal to the capitalist mode,

but technology was itself part of the dynamic of both these modes of production. The efforts of the feudal ruling class to exact increasing revenue from their mines led not only to the emancipation of miners, but to the development of new methods of exploitation. The "free" miners attempted to expand production with the application of new techniques, as well as introducing equipment to drain the water and raise the ore, with their efforts frustrated because of the limitations of finance. With the entry of capital into mining, the relationships between the producers, non-producers, and technology was transformed. The introduction of new techniques did not necessarily improve the working conditions of the producer, but was intended to expand productivity, such as was the case in Cornwall.

Cornish engineers pioneered most of the major advances in mining technology, and in the nineteenth century they carried the Cornish pumping engine (and often Cornish miners too) to every part of the world. But in Cornwall itself their achievement was extraordinarily one-sided. They made it possible to discover and bring up ore from the deepest levels; but for all their winding engines and pumps and their maze-like ventilation systems, they invented little or nothing to lighten the miner's work load. When it came to transport the crooked shafts and slanting galleries seem to have defeated them. The primitive man engine (a rudimentary and perilous version of the 'cage') was never generally installed, despite the faith expressed in it by witnesses before Lord Kinnaird's Commission in 1864: the miner was left to climb it.¹¹⁵

Similarly, in other types of mining technological innovation multiplied as steam driven pumping, ventilating, and hoisting equipment was introduced into coal, copper, lead, and other mines. In the latter half of the nineteenth century the mechanical coal cutter was developed, while for drilling in all mines various types of pneumatic drills were designed.¹¹⁶ While such mechanical innovations increased production, however, they also increased the level of dust in the mines, particularly when the drilling¹¹⁷ was done under dry conditions.

One final aspect of the development of technology associated with mining surrounds the increase of geological knowledge on the part of mine officials.

The details of this movement we need not stop to analyze. Suffice it to say that its mainspring is probably to be found in the increase of engineering skill and geological knowledge among mine captains and agents of mining companies, which tends to increase their caution in the abatement of work to tributors and lessens the latter's chances of making a lucky strike.¹¹⁸

Such knowledge removed much of the speculation involved in the development of underground workings, particularly when facilitated by the development of diamond drilling and other exploration methods.

The development of the capitalist mode of production in mining involved the transformation of miners into a proletariat with the capitalist becoming responsible for the labour process. The transformation of the "free" miner into a proletariat occurred through a process unlike that of the method of eviction in English agriculture. Rather, it involved the eventual transition of the "free" miner through various forms of contract (i.e., tribute and tutwork) and piece-work toward time-work. This process involved the eventual transformation of miners' associations into associations in which the members contributed money and hired labourers, facilitating the entry of capital into mining. Further, in conjunction with the transition from feudalism to capitalism, as the feudal ruling class attempted to exact increasing amounts of revenue from the mines, they placed more pressure on the "free" miners, leading to the entry of tributors into their mines, and the leasing of part or all of the mining properties of the associates to capitalists. The capitalist mode of production then involved the on-going transition of miners into wage-labourers, with decreasing control over their labour-power.

Summary

Throughout this chapter the emphasis has been on the nature of the social relations of production within mining in the feudal, petty commodity, and capitalist modes of production, and the development of such relations in conjunction with the transition from feudalism to capitalism. Such discussion intended to place on a more concrete level the theoretical framework developed in the first chapter, with respect to modes of production. In order to do so, mining was described in terms of the feudal, petty commodity, and capitalist modes of production, bearing in mind the possible risks of a static description of these modes. As a result, the problem of the transition from feudalism to capitalism became all important, with the ensuing discussion on mining put in terms of the three modes of production. In examining mining in this way, emphasis was placed on the economic foundation of a social formation, at the expense of the political and ideological aspects of modes of production. The focal point, therefore, was on the relations of production (property relations and relations of appropriation) and the corresponding material forces of production (labour process and technology) as it related to mining.

In discussing mining in terms of the feudal mode of production it was illustrated that mining, while appearing at a point in time as a parallel to the feudal relations in agriculture, underwent a transition with the struggle for increased surplus extraction on the part of the feudal rulers in order to maintain their class position. Mining, which formerly involved the application of serf labour, was transformed into an occupation and the miner acquired a status similar to the guild craftsmen in the urban centres. No longer was he a serf, but instead was emancipated from the

bonds of serfdom, and as a "free" miner he had the right to mine on most available land, giving possession to the miner while title (ownership) remained with the landlord. The forces within the feudal mode which facilitated the development of the "free" miner also, however, placed constraints in front of him--constraints which eventually played a major part in his demise. The struggle over increased surplus exaction associated with the birth of the "free" miner was to be the basis of his undoing. As a "free" miner, he was still under certain obligations to work the ground or forfeit possession, and to make payments (royalties) of specified percentages of production to the landlord and feudal rulers. To increase such revenue the feudal landlords would oblige the "free" miners to expand production; an obligation which both individuals and associations of "free" miners found difficult to meet because of a lack of resources beyond their labour-power. This generally led to the entrance of money contributing associates, or the lease of properties to individuals with capital and hired labour, an eventuality which placed mining well on the road toward capitalist productive relations. Further, the practice of the feudal lords requiring the miners to have their ore smelted at smelters owned either by themselves, or their concessionaires served only to compound the situation. The basis of the decline of the feudal mode of production in mining, and the eventual transition toward the petty commodity and capitalist modes was in the dynamic of the feudal mode; the struggle over the increasing exaction of surplus in the form of royalties and rent on the part of the feudal rulers.

In the discussion on petty commodity mode of production, it was argued that this mode was essentially an intermediate mode, the development of which occurred in conjunction with the transition between dominant modes

(i.e., feudalism to capitalism); the intermediate mode developing to the fullest while the constraints from the other mode(s) were lowest. It was further argued, therefore, that the petty commodity mode had developed to its fullest in the United States, since it was less constrained than in Europe, where petty commodity producers were caught between feudal lords and developing capitalists. In mining the petty commodity producer was characterized by the "free" miner; and like the counter-part in the craft guild, the labour process involved a relatively low-level of technological innovation, and a small amount of equipment.

Examination of mining in terms of the capitalist mode of production emphasized that with the transition to the capitalist mode there occurred a transformation of both the social relations of production and the labour process. Such a change involved the gradual transformation of the "free" miners into a mining proletariat (artisan, tributer, tutwork, pieceworker, and eventually time-worker); this transformation resulted in an increased loss of control over, and eventual subordination to, the labour-process on the part of the producing miners. The process of transition which led to the transformation of the "free" miner into a proletariat, it was illustrated, facilitated the development of capitalists associated with mining; a process, also discussed with regard to the feudal mode of production, by which early mining associates came to be dominated by partners contributing money, or being replaced by leases directly let out to capitalists who hired labour to work the mines. Just as in the feudal mode, the struggle for increased surplus (royalties and rent) was the internal dynamic which led to the decline of the feudal mode, so the struggle for similar surplus (surplus-value) was the internal dynamic associated with the transformation of the "free" miners and tributers toward piece and time workers.

In the ensuing chapter discussion will turn to the development of mining in Canada in terms of the petty commodity and capitalist modes of production, including the struggle between the modes. Whereas in this section, attention was placed strictly on the social relations of production and the corresponding material forces of production associated with mining, in the next section emphasis will be put on describing the development of mining in Canada in the context of changing modes of production, relating the transition from the petty commodity to the capitalist mode, to the development of capitalism as a world system. Thus, the second aspect of the theoretical framework developed in Chapter I will be dealt with on a more concrete level.

NOTES TO CHAPTER III

1. This peripheral nature of mining may be due in part to its general decline with the fall of the Roman Empire. Throughout Europe, including Britain, in the fifth century, there occurred a decline lasting in certain regions upwards to the tenth century. Such a decline has, in some sources, been attributed to the destruction of the Roman Empire's monetary system. However, the destruction of Rome also entailed the destruction of a mode of production, generally referred to as classical antiquity, and characterized by slave-labour, including within mining. See T.A. Rickard, Man and Metals, Volume II. (New York, 1932), pp. 507-511; L.F. Salzman, English Industries of the Middle Ages. (London, 1913), pp. 1-76; Sylvia Thrupp, "Medieval Industry, 1000-1500", in C.M. Cipolla (ed.), The Fontana Economic History of Europe, Volume I. (London, 1972), pp. 238-239.
2. This point is illustrated by Jurgen Kuczynski with respect to mining in Germany in the 1800s where he argues it maintained certain feudal characteristics. See: J. Kuczynski, The Rise of the Working Class. (New York, 1971), pp. 207-212.
3. The choice of 800 A.D. and 1500 A.D. as dividing lines is somewhat arbitrary, made more for purposes of discussion rather than to represent any hard and fast boundaries. At approximately 800 A.D. the use of slaves in the mines of Europe began to be replaced by serf labour. By the sixteenth century numerous changes had taken place within mining, such that it appeared relevant to use this date as a terminal point. One such occurrence was the increase of tribute work in the Cornwall tin mines, which Dobb describes as a "halfway house to the wage system". In addition, the sixteenth century saw the rise of royally-chartered mining companies such as the Mines Royal and the Society of Mineral and Battery Works which together at one time "employed 10,000 persons". Similarly, Carlo Cipolla uses similar divisions as the boundaries for a discussion of the economic history of feudalism in Europe. See: Maurice Dobb, Studies in the Development of Capitalism. (New York, 1947), pp. 140-141, 250; Carlo Cipolla, The Fontana Economic History of Europe, Volume I/The Middle Ages. (London, 1972).
4. Infra, Chapter I, pp. 13-14. Also see: Rodney Hilton, "Introduction", in The Transition from Feudalism to Capitalism. (London, 1976), p. 28.
5. Rodney Hilton, "A Comment", in The Transition from Feudalism to Capitalism. (London, 1976), pp. 113-114.
6. Hilton, "Ibid.", pp. 114-117.

7. T.A. Rickard, Man and Metals, Volume II, p. 515.
8. Rickard, Ibid., pp. 576-578.
9. Rickard, Ibid., p. 599.
10. Rickard, Ibid., pp. 547-548.
11. Sylvia Thrupp, "Ibid.", p. 239.
12. Rickard, Op. cit., p. 533.
13. Rickard, Ibid., pp. 599-600.
14. Rickard, Ibid., pp. 600-601.
15. Rickard, Ibid., pp. 601-606. Also see: G.R. Lewis, The Stannaries/ A Study of the English Tin Mines. (Cambridge, Mass., 1924), pp. 79-84.
16. Rickard, Op. cit., pp. 548-549.
17. Rickard, Ibid., p. 596.
18. Kuczynski, Op. cit., pp. 207-212. Rickard speaks of a continuity between the guilds and the later labour unions of miners. Further, in Germany, the present-day miners' unions continue to maintain some of the trappings of feudal guilds, such as uniforms, special celebrations, and parades. For a fuller description of the maintenance of such pageantry among the German miners, see Wolfgang Paul, Mining Lore. (Portland, Ore., 1970); Rickard, Op. cit., pp. 549-550.
19. Rickard, Ibid., p. 589.
20. Rickard, Ibid., pp. 550-552.
21. Rickard, Ibid., pp. 552-553.
22. Rickard, Ibid., pp. 552-553.
23. Lewis, Op. cit., pp. 177-178.
24. Lewis, Ibid., p. 178.
25. Lewis, Ibid., p. 179.
26. Lewis, Ibid., pp. 179-182.
27. Lewis, Ibid., pp. 182-183.
28. Lewis, Ibid., p. 181.

29. Lewis, Ibid., pp. 188-189.
30. L.F. Salzmann, Op. cit., pp. 70-71. Also see: Lewis, Op. cit., pp. 189-190.
31. Lewis, Ibid., p. 179.
32. Lewis, Ibid., p. 184.
33. Lewis, Ibid., p. 184.
34. Lewis, Ibid., p. 184.
35. Lewis, Ibid., p. 75.
36. Lewis, Ibid., pp. 76-77.
37. Lewis, Ibid., p. 185.
38. Rickard, Op. cit., pp. 600-606. Salzmann points to similar conditions of payment by the miners, such as the tanners of Cornwall. "For his claim he paid to the lord of the land, whether it were the king or a private lord, a certain tribute of ore, usually the tenth or the fifteenth portion." Salzmann, Op. cit., p. 71.
39. Rickard, Op. cit., pp. 531-532.
40. Lewis, Op. cit., pp. 176-178.
41. Lewis, Ibid., pp. 181-183. Agricola, in his account, De Re Metallica, describes the development and nature of numerous methods and equipment associated with mining and metallurgy. His work, written in the mid-1500s, covered all facets of mining from the nature of ore-bodies, through surveying on both the surface and underground, methods of excavating, timbering, drainage, and hoisting, to extractive methods involving the crushing, separation, and smelting of ore. In the area of mine drainage, he describes rather sophisticated methods of pumping, involving the use of bucket-chains, and rag pumps powered by wind, water, and animals. With respect to hoisting, similarly sophisticated methods existed, and were powered by similar means. One example is provided in the case of rag and chain pumps:

Of the rag and chain pumps there are six kinds known to us, of which the first is made as follows: A cave is dug under the surface of earth or in a tunnel, and timbered on all sides by stout posts and planks, to prevent either the men from being crushed or the machine from being broken by its collapse. In this cave, thus timbered, is placed a water-wheel fitted to an angular axle. The iron journals of the axle revolve in iron pillows, which are held in timbers

of sufficient strength. The wheel is generally twenty-four feet high, occasionally thirty, and in no way different from those which are made for grinding corn, except that it is a little narrower. The axle has on one side a drum with a groove in the middle of its circumference, to which are fixed many four-curved iron clamps. In these clamps catch the links of the chain, which is drawn through the pipes out of the sump, and which again falls, through a timbered opening, right down to the bottom into the sump to a balancing drum. There is an iron band around the small axle of the balancing drum, each journal of which revolves in an iron bearing fixed to a timber. The chain turning about this drum brings up the water by the balls through the pipes. Each length of pipe is encircled and protected by five iron bands, a palm wide and a digit thick, placed at equal distances from each other; the first band on the pipe is shared in common with the preceding length of pipe into which it is fitted, the last band with the succeeding length of pipe which is fitted into it. Each length of pipe, except the first, is bevelled on the outer circumference of the upper end to a distance of seven digits and for a depth of three digits, in order that it may be inserted into the length of pipe which goes before it; each, except the last, is reamed out on the inside of the lower end to a like distance, but to the depth of a palm, that it may be able to take the end of the pipe which follows. And each length of pipe is fixed with iron clamps to the timbers of the shaft, that it may remain stationary. Through this continuous series of pipes, the water is drawn by the balls of the chain up out of the sump as far as the tunnel, where it flows out into the drains through an aperture in the highest pipe. The balls which lift the water are connected by the iron links of the chain, and are six feet distant from one another; they are made of the hair of a horse's tail sewn into a covering to prevent it from being pulled out by the iron clamps on the drum; the balls are of such size that one can be held in each hand. If this machine is set up on the surface of the earth, the stream which turns the water-wheel is led away through the subterranean drains. The buckets of the water-wheel, when struck by the impact of the stream, move forward and turn the wheel, together with the drum, whereby the chain is wound up and the balls expel the water through the pipes. If the wheel of this machine is twenty-four feet in diameter, it draws water from a shaft two hundred and forty feet deep. But such work requires a stream with greater water-power.

The use of machinery, such as described by Agricola, became more common toward the end of the feudal epoch, and was beyond the means of mining partnerships composed of labouring partners. The advent of such machinery and methods appears with the transition toward the capitalist mode of production in mining; the miners becoming mine-workers while the associates increasingly becoming non-workers. Georgius Agricola, De Re Metallura. (Trans. by Herbert Clark Hoover and Lou Henry Hoover) (New York, 1950), pp. 189-190.

42. James O'Connor, "Review: The Twisted Dream by D.F. Dowd", in Monthly Review (March 1975), pp. 46-54.
43. Supra, Chapter I, pp. 15-18.
44. O'Connor, "Op. cit.", pp. 49-50.
45. Lewis, Op. cit., pp. 178-183. Lewis chronicles this transition as the "free" miners, more and more, lost control over the mining associations to partners contributing money instead of labour.
46. J. Hatcher, English Tin Production and Trade Before 1550. (Oxford, 1973), pp. 44-47. Also see: Salzmann, Op. cit., pp. 64-66; Lewis, Op. cit., pp. 3-4.
47. Hatcher, Op. cit., p. 44. Also see: J.B. Richardson, Metal Mining. (London, 1974), pp. 61-64.
48. Lewis, Op. cit., p. 183.
49. Hatcher, Op. cit., p. 47.
50. Lewis, Op. cit., pp. 186-187.
51. Lewis, Ibid., pp. 189-190. Also see: Salzmann, Op. cit., pp. 69-70.
52. Lewis, Op. cit., p. 202.
53. O'Connor, "Op. cit.", pp. 47-48.
54. O'Connor, "Ibid.", p. 47.
55. O'Connor, "Ibid.", p. 50.
56. O'Connor, "Ibid.", pp. 50-51. O'Connor argues that this struggle between capital and independent producers was a somewhat extended struggle, having serious implications for the development of American capitalism.

What was unique about American capitalist development in this respect, as Marx recognized, was the ability of petty commodity production to keep

capital at bay for a relatively long time. The fact that independent production was especially long-lived . . . modified the character of capital when the latter subsequently emerged and triumphed.

57. O'Connor, "Ibid.", pp. 48-49, 51-52.
58. A.C. Todd, The Cornish Miner in America. (Truro, 1967), p. 47. Also see: O'Connor, "Op. cit.", p. 50; T.A. Rickard, A History of American Mining. (New York, 1932), pp. 147-178.
59. Rickard, A History of American Mining, p. 32.
60. Rickard, Man and Metals, Volume II, p. 619.
61. Rickard, A History of American Mining, pp. 32-33. Also see: W.P. Morrell, The Gold Rushes. (Chester Spring, Penn., 1968), pp. 89-93; Rickard, Man and Metals, Volume II, pp. 620-622.
62. Rickard, A History of American Mining, pp. 33-34.
63. Morrell, Op. cit., pp. 98-106.
64. Morrell, Ibid., pp. 193-198. Also see: Rickard, Man and Metals, Volume II, pp. 625-628.
65. Morrell, Op. cit., p. 195. Also see: Rickard, Man and Metals, Volume II, p. 627.
66. Rickard, Man and Metals, Volume II, pp. 632-634.
67. Such a destruction of the "free" miner led Rickard to lament:

From slave to serf to artisan, he had advanced during the long centuries, and when as an adventurer he set out on his golden quest to Australia and California he was at the height of his social advancement; he was his own master, the world was his oyster, and he had to use his own pick to pry it open, in search not of pearls but of nuggets. The diggers in Australia were free men; they had the zest of discovery and the joy of achievement, but, almost from the beginning, the hands of the Government was on them and they knew the trammels of political restraint. The gold-seekers in the Sierra Nevada, on the other hand, were free from all such ties; they had liberty such as no men ever had; to them the world was young, and life an epic.

Rickard, Man and Metals, Volume II, p. 634.

68. Rickard, Man and Metals, Volume II, p. 564.
69. Rickard, Man and Metals, Volume II, pp. 565-566.
70. Lewis, Op. cit., p. 192.
71. Lewis, Ibid., pp. 193-194.
72. Marx, Capital, Volume III. (New York, 1967), p. 334.
73. Dobb, Studies in the Development of Capitalism. (New York, 1947), pp. 128-129.
74. Marx, Capital, Volume III, p. 334.
75. Marx, Capital, Volume III, p. 335.
76. Dobb, Op. cit., p. 242.
77. Dobb, Ibid., p. 242.
78. Dobb, Ibid., pp. 253-254.
79. Dobb has argued that mining based on the free mining communities depicts rather clearly this process of the formation of the proletariat. Dobb, Ibid., p. 242.
80. Dobb, Ibid., p. 244.
81. Dobb, Ibid., p. 244.
82. Dobb, Ibid., p. 245. Also see: Rickard, Man and Metals, Volume II, p. 552.
83. Dobb, Op. cit., pp. 245-246. Also see: Lewis, Op. cit., pp. 208-209.
84. Salzmann, Op. cit., pp. 69-70. Also see: Dobb, Op. cit., pp. 245-246; Lewis, Op. cit., pp. 187-190.
85. Dobb, Ibid., p. 244.
86. Dobb, Ibid., pp. 244-245. Also see: Lewis, Op. cit., p. 190.
87. Lewis, Ibid., pp. 190-191.
88. Dobb, Op. cit., p. 250.
89. Dobb, Ibid., p. 245. Also see: Lewis, Op. cit., pp. 178-180.
90. Lewis, Ibid., p. 189.

91. Lewis, Ibid., pp. 202-203, 229.
92. Lewis, Ibid., p. 229.
93. Raphael Samuel, "Mineral Workers", in Miners, Quarrymen and Saltworkers. (London, 1977), pp. 57-58.
94. L.L. Price, "West Barbary", in Cornish Mining: Essays on the Organization of Cornish Mines and the Cornish Mining Economy. (Edited by Roger Burt) (Newton Abbots, 1969), pp. 187-188. Also see: Lewis, Op. cit., p. 229.
95. The only other region of Britain in which a similar system to tribute work appears to have developed was in the slate quarries of North Wales. In the quarries there developed a system known as the "bargain system".

It was a system which in its different forms was known in other extractive industries though perhaps in no other did it survive on such a scale into the twentieth century. The problem which the system was supposed to deal with was the one posed by the tremendous unevenness in the nature of the rock worked, from one part of the quarry to another. Thus one crew's stretch of rock might be buckled or the slate imperfect while another's would be finely grained and easily worked; as it was quarried, moreover, the nature of the rock was constantly changing. Any wages system which merely remunerated men for the number of slates produced was therefore clearly inoperable. The bargaining system meant that each crew of four or five quarrymen would negotiate a monthly contract with the management, the terms of which contract depended on the assessed ease or difficulty of extracting slates from the face in question; on the basis of the monthly bargain the men were paid a sum of 'poundage' per pound's worth of slates produced. Men working on inhospitable rock would be paid a high poundage, compensating for the low yield or poor quality of the slates produced, those quarrying good rock received a low poundage.

This system was similar to the tribute system in Cornwall where payment was based on a percentage of the yield. Ore of a higher quality or richness brought a lower percentage return to the tributer. One result was a cat-and-mouse game between the tributers and the mine captains, as Samuel has described, whereby the tributers attempted to conceal the profitability of the pitch under contract. Merfyn Jones, "Y chwarel wyr: The Slate Quarrymen of North Wales", in Miners, Quarrymen and Saltworkers. (London, 1977), p. 104; Samuel, "Ibid.", pp. 57-58.

96. Lewis, Op. cit., pp. 180-181.
 97. Lewis, Ibid., pp. 203-204. Also see: Price, "Op. cit.", pp. 133-135.
 98. Samuel, "Op. cit.", pp. 56-57.
 99. Samuel, "Ibid.", pp. 48-50. Two unique forms of contracting developed in Britain, associated with coal mining. In Durham, during the eighteenth century and the first half of the nineteenth century, there existed a system of contracting, referred to as binding, whereby once a year and during the same weeks of the year all the colliers in the coalfield were hired simultaneously for the duration of the succeeding year. The bonds tended to result in a uniformity in the terms of contract, on the part of the coal mine owners, while, simultaneously, this led toward a system of formal collective bargaining, although individual owners and miners may have found that such collective action distasteful, and were reluctant to accept the developing situation. For a fuller discussion on this system, see P.E.H. Hair, "The Binding of the Pitmen of the North-East, 1800-1809", The Durham University Journal, Vol. LVII, No. 1 (New Series Vol. XXVII, No. 1). (December 1965), pp. 1-13.
- The second system of contracting was the "butty" system, which might more accurately be called sub-contracting. In this system "contracts were hired out to a buttyman--to a sub-contractor who was paid a price by management and then decided how much the workers who actually did the job were worth paying. He managed to keep his power by building up a collection of blue-eyed boys, his favourites, paying them a little extra, or finding them 'better' jobs. In many cases the men in the pit had to literally fight to get the money, they were entitled to off the buttyman." Needless to say, this system, which developed in Yorkshire was hated by the miners. Dave Douglass, "Pit Talk in County Durham", in Miners, Quarrymen, and Saltworkers. (London, 1977), p. 309. Also see: Samuel, "Op. cit.", pp. 18-19.
100. Lewis, Op. cit., pp. 180-181.
 101. Lewis, Ibid., p. 228.
 102. Samuel, "Op. cit.", p. 48. Also see: Lewis, Op. cit., p. 204.
 103. Lewis, Ibid., pp. 190-191.
 104. Lewis, Ibid., pp. 177-178.
 105. Lewis, Ibid., p. 181.
 106. Lewis, Ibid., p. 181.

107. *Infra*, pp.135-136. Also see: Rickard, Man and Metals, Volume II, pp. 564-566; Lewis, *Op. cit.*, p. 192. Rickard discusses a number of concessions granted by the Tudors to various concessionaires.

The Tudor queen, it appears, granted extensive mining rights to sundry Germans, among whom this Daniel Houghstetter, or correctly, Hochstetter, was the most prominent Hochstetter settled in Cardiganshire and worked successfully in the silver-lead mines, but later he failed financially, although after him the local production of silver was such as to cause a mint to be built in this district When such a concession was granted, a joint-stock company was organized, usually headed by sundry illustrious noblemen, anxious alike to comply with the Queen's wishes and to participate in a promising venture.

Rickard, Man and Metals, Volume II, pp. 538-539.

108. Dobb, *Op. cit.*, p. 250.
109. Dobb, *Ibid.*, p. 250. Also see: Lewis, *Op. cit.*, pp. 208-209.
110. Lewis, *Ibid.*, pp. 229-230.
111. Lewis, *Ibid.*, pp. 223-224.
112. Lewis, *Ibid.*, p. 226.
113. Richardson, *Op. cit.*, pp. 102-105. John Vivian was the forefather of the Vivian interests which became involved in the Sudbury nickel mines in the early twentieth century. See: O.W. Main, The Canadian Nickel Industry: A Study in Market Control and Public Policy. (Toronto, 1955)
114. Rickard, Man and Metals, Volume II, pp. 537-540.
115. Samuel, "Op. cit.", p. 35.
116. Samuel, "Ibid.", pp. 37-41.
117. Samuel, "Ibid.", p. 47.
118. Lewis, *Op. cit.*, p. 204.

CHAPTER IV
MINING AND THE INDUSTRIAL REVOLUTION
IN CANADA, 1845-1920

In this chapter discussion will concentrate on the transition to, and development of, the capitalist mode of production within Canada as capital developed and expanded on a world scale. This section, therefore, represents an attempt to deal with the development of mining in Canada in light of the theoretical framework developed in Chapters I and III. In Chapter I a theoretical framework was developed, involving two fundamental concepts: (1) modes of production and (2) the process of capital accumulation on a world scale. Chapter III, in turn, represents an analysis of the development of mining generally, in terms of the concept of modes of production, as formulated in Chapter I. The present chapter, therefore, centres on the emergence of mining as an illustration of the developing social relations of production associated with the transition. The centre of attention will revolve around two issues: (1) the expansion of the capitalist mode of production increasingly on a world scale as it related to the industrial revolution in Canada--a revolution which has generally been viewed as having occurred during the period from approximately 1840 to 1890; and (2) mining as a reflection of the transition toward the capitalist mode associated with the "Canadian" industrial revolution.

In examining these two issues, the discussion will proceed by illustrating the development of mining within Canada. Such emphasis will parallel the previous chapter, but with attention directed to the development of mining in terms of the petty commodity and capitalist modes of

production, and placing particular emphasis on the character of the social relations of production, and of the forces of production within mining in Canada prior to 1920. In doing so, attention will not be placed on the nature of the specific modes (petty commodity and capitalist) as two separate entities, but it will be put on the transformation of the social relations of production and the labour process associated with the transition from the petty commodity to the capitalist mode. This emphasis on petty commodity and capitalist mode in comparison to the feudal mode mentioned in Chapter I arises from the apparent non-existence of a feudal mode of production associated with Canadian mining. While it has been argued by Pentland that there existed the feudal mode of production within mining in Canada, under the French Regime at the Forges of St. Maurice near Trois Rivieres, the main thrust of the thesis involves the development of mining under the aegis of the British colonial system at a period¹ in which the Industrial Revolution in Britain was near completion. Further discussion of the pre-Conquest period, however, will be undertaken later.

Secondly, discussion will emphasize the expansion of capital on a world scale as it conditioned the development of mining in Canada in terms of the social relations of production and the productive forces. Such discussion will focus on extending the schema essentially developed in terms of the nature and transition of modes of production. The development of mining in capitalism, rather than being viewed in terms of national units or systems, is conceptualized as occurring internationally. In studying the development of mining within Canada in terms of the petty commodity and capitalist modes of production, the question becomes one of the formation of a proletariat, and of the expansion of capital within

Canada, as influenced by external as well as internal forces. As Ryerson maintains, not only was the development of the capitalist mode of production influenced by internal forces, but also the conditioning influences of the Industrial Revolution and colonial network of Britain, and later, the corresponding development of the capitalist mode in the United States.² Mining within Canada will, therefore, be viewed in this section as a reflection of this course of development.

The Social Relations of Production in Canadian Mining

In this section emphasis, which will be almost entirely descriptive in nature, will be placed on the development of the social relations of production, and the corresponding development of the productive forces (labour process and technology) within Canadian mining. The central periods associated with the discussion involve what have been termed the period of the Canadian Industrial Revolution, from approximately 1840-1845 to about 1885-1890, and the period of consolidation, which followed rather quickly on the heels of the Industrial Revolution, from approximately 1890 to 1920 (although the process is on-going).

The question of an Industrial Revolution has been a major point of discussion in writings on the development of capitalism within Canada, although a large portion of such discussion does not question the fact that such a revolution occurred, but, rather, it involves the issue about who was responsible for the changes--indigenous (Canadian) capitalists or predominantly American capitalists.³ As mentioned previously, by 1840-1845, noticeable changes had occurred and were continuing to take place as staple production was becoming complemented by the production for a "home-market".

Around the middle of the nineteenth century, the Province of Canada was transformed from a raw, staple-producing area to a rounded, integrated economy that might be called metropolitan. Signs of the change were visible in 1830, unmistakable in 1840. By 1850 change had gone too far to be turned back and 1860 and 1870 can denote only the filling out of the home-market exchange economy already implicit. Purely extractive industry was overlaid with a secondary development involving an elaborate transportation system, a capitalistic agriculture, an extensive list of manufactures that appear to have been efficient in their day, and a creditable financial structure. Probably the most telling evidence of the transformation was the fact that this colony, so recently at the mercy of the fluctuations of imperial markets for one or two commodities, could undertake successfully to swallow an empire of its own in the years after 1867.⁴

Ryerson also notes similar changes in this period, associated with the construction of railways, as well as the development of larger-scale enterprises. Railways served both directly and indirectly as an instrument of the process of transition toward a capitalist mode of production; directly in that railways, in terms of their construction and operation (including maintenance), involved the relations of capital and wage labour; and indirectly, railways facilitated the expansion of the application of machinery into such "staple" industries as lumbering, and as the means of communication between producers (or producing centres) and markets.⁶ While such an expansion of railway networks occurred, Ryerson also argues that there had occurred a "transition from hand-work to mechanization, from the early 'manufactory' to the plant employing power-driven machinery", although the change was uneven and quite often slow.⁷ Although the thrust of discussion in this section deals predominantly with the period of industrial revolution, and the subsequent period of consolidation, discussion of the period prior to such transition is imperative in order to obtain a better understanding of the forces associated with the development of mining in the later periods.

Mining Prior to 1840

The development of mining in Canada prior to its first major expansion period (before 1840 to 1890) can be divided into two parts:

(1) mining under the French regime and (2) mining after the British conquest of Canada. The reason for the division lies with differences in the colonial relationship which existed under the two colonial systems--differences related to the variations in the development of capitalism in Britain and France, although both colonial systems were ostensibly mercantilist.

Under the French regime, mining in Canada was a very primitive affair, with the exception of the Forges of St. Maurice. During this period, some interest was intermittently shown in the colony's mineral resources. From the beginning, local limestone and slate deposits served as sources of building materials for lime kilns and tile production. In addition to such endeavours, the mining of metals and coal was attempted in three regions: (1) Lake Superior, (2) Cape Breton, and (3) the somewhat successful venture at St. Maurice.

In the Upper Great Lakes regions, French fur traders noticed the occurrence of copper and lead. The earliest mention of such minerals appears to have been in a book published in 1636, where the occurrence of native copper near Lake Superior was mentioned. In the 1690s the French traded with Indians along the upper Mississippi for lead. Mining and smelting, however, was done by Indian labour, mostly performed by women, and involving very primitive methods (that is, grubbing)--although it appeared that the smelting methods were obtained from the French traders. The eighteenth century saw possibly the earliest attempt at mining copper

along Lake Superior by the Europeans. In 1738, on a voyage of Lake Superior, a party under Sieur de la Ronde, in the company of two German miners, discovered copper on the North Peninsula of Michigan, and located two mines near the Chagouamigon (St. Anne's) River, where a fort was constructed. The following year, Sieur de la Ronde, in partnership with a Montreal merchant named Sieur Charly, had brought out from Germany eight miners, two smeltermen, a carpenter, mason, and a blacksmith to develop the mines. With the death of Sieur de la Ronde in 1741, however, the project was never completed, and the works were eventually abandoned in 1747 without being developed.¹¹

The earliest mention of coal in North America by the French appeared in a book by Nicholas Denys, published in 1672 and entitled Description Geographique et Historique des Costes de l'Amerique Septentrionale. Denys, who was "appointed governor of all the eastern part of Acadie, including Cape Breton, in the year 1637 . . . obtained a concession (in 1654) from Louis XIV of the whole island, with full powers to search for and work mines of gold, silver, copper, and other minerals, paying to the king one-tenth of the profit".¹² No attempt was made by Denys to mine coal, although after his departure in 1672, unauthorized persons took coal from the cliffs without seeking permission from his sons, who were acting as caretakers of his interests. This led to the issuance of an ordinance "on August 21, 1677, by M. Duchesneau, the Intendant of New France, recognizing and establishing Denys's right to exact a duty of twenty sous per ton from all persons taking coal from Cape Breton". The patent was later revoked¹³ in 1690. It was approximately 1720 when the first regular mining took place in Cape Breton, mainly to supply coal to the fortress at Louisbourg,

as well as some trade with the French colonies in the West Indies, and clandestine trade with the New England colonies, particularly Boston. These operations almost totally ceased after the loss of Cape Breton to Britain in 1745.¹⁴ During the subsequent period of French restoration from 1749 to 1758, when full possession of Cape Breton finally went to Britain with the destruction of Louisbourg, the French traded in coal with New England, although the coal served also as ballast for ships trading with French West Indies. In the same period a certain amount of clandestine trade with New England sprung up again. With the loss of Cape Breton to Britain,¹⁵ coal production seemed to have languished.

The third, and most successful, area of mining developed by the French was associated with the Forges of Saint Maurice. Attempts were made to exploit the iron deposits near Trois Rivières, beginning with Jean Talon. Due to problems with the colonial officials associated with the feudal-absolutist society in France, however, the works did not get started until 1730, when François Poulin, a Montreal merchant and seigneur of St. Maurice, obtained from the French government a concession for the workings,¹⁶ bringing other merchants and officials into the enterprise. In undertaking operations, two ironworkers were initially brought from France, while a Canadian was sent to New England in order to study the method of making bar iron. With the construction of a forge and workers' barracks, equipment, such as bellows, was imported from France, along with additional ironworkers. By 1741, when the works went into bankruptcy, it consisted of two furnaces.¹⁷ From that time on the works were operated by the state, and, in the following year (1742) had an output of 5,000 pounds daily in various forms of castings. By 1749 the workforce consisted of one hundred and twenty men, and a community associated with the forge of five hundred.¹⁸

The undertaking of these operations by the French has, as earlier stated, been described as feudal organizations (particularly the forges of St. Maurice).¹⁹ In the instance of the Lake Superior copper mines, Sieur de la Ronde engaged "free" miners from Germany, miners organized along the lines of craftsmen guilds.²⁰ The Cape Breton coal miners, when under the French regime, appear to have undertaken operations on the basis of independent (individual) petty producers, with operations involving simply the excavation of coal along the outcrop of a seam using the minimal amount of tools (usually shovels and iron crowbars).²¹ The St. Maurice forges, unlike the previous two endeavours, involved a much more highly developed division of labour. The question of whether this enterprise was of the nature of a feudal mode of production or was of an early or transitional form toward the capitalist mode centres around the nature of the relation between the producers and non-producers and the nature of the labour process. Pentland has argued that the forges represent a case of feudal labour organization, basing such assessment on the guild nature of its organization; the workforce was composed of a tightly-knit community, isolated from the balance of New France, and possessed a "jealously guarded hierarchy of status", and occupations. Further, because of the paternalistic nature of the French feudal-absolutist state, which was operator of the forges until the British conquest, Pentland associated the operations with feudal organization.²² Ryerson's assessment of the forges, however, varies with the above interpretation of Pentland's in that he views the forges, along with a number of other enterprises begun under the tutelage of Jean Talon, as "seedlings of capitalism", based on the distinction between modes of production and the larger social formations. The forges represented an

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early form of transition towards capitalist productive relations. While both authors have drawn from the same sources, the lack of further information on such operations does not permit one to accurately ascertain the specific mode associated with the forges. Although the forges existed within a social formation dominated by an advanced stage of the feudal mode of production, the guild nature of its organization and the contract nature of the work, just as with the "free" miners of Europe, represented a level of development of the productive relations and forces that were of an embryonic or transitional nature with respect to the capitalist mode ("seedlings of capitalism"). The influences of the feudal-absolutist state upon such enterprise served only to stifle its development.

With the conquest of New France by the British, iron mining and smelting continued at Trois Rivières (St. Maurice), along with coal mining on Cape Breton. With the exception of attempts to expand iron production, however, metal mining did not develop to any noticeable degree until the 1840s, when the forces of industrial capital were making their presence known.

The coal mines in Cape Breton, after the Treaty of Utrecht in 1763, languished under the possession of the British Government until the separation of Cape Breton in 1784. The only production during that period was mostly by soldiers in order to meet the needs of the military units stationed in Nova Scotia, plus a small amount of production by coal smugglers. No systematic methods of mining were developed by either the government or
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the smugglers.

Even when the Government undertook the working of mines, no regular system was pursued. Having obtained all that was easily accessible from the face of the cliff at one place, instead of driving a level further into the seam, it was abandoned, and work commenced at another. That the contraband traders should have followed this

system is not surprising, as their works were at any time liable to be taken possession of by the Government. Consequently, when they had exhausted any particular seam and could not pursue it further without some labour, they removed to another, where the coal could be literally shovelled from the outcrop into their boats. Under such circumstances, the reader will not be surprised to learn that, after the island had been twenty-two years in the undisturbed possession of Great Britain, and surrounded by colonies requiring large supplies of fuel, the quantity raised in any single year, as far as we can learn never exceeded 3,000 chaldrons.*²⁵

In 1784, with the formation of a separate government in Cape Breton, "the order forbidding the granting of land in Cape Breton, issued in 1763,²⁶ was revoked". Under the first governor, Lt.-Col. Desbarres, the mines were worked on government account from 1784-1787. Desbarres's successor, Colonel Macormick, leased the mines in 1788 to Thomas Moxley, beginning a period of successive leasings and operations on government account until the mines came into the possession of the General Mining Association at the close of 1826. The various lessees paid a royalty on production varying from three shillings to four shillings and three pence per ton. During this period the problem of coal smuggling continued to plague the operations, with the result that the government imposed stiffer penalties on offenders (forfeiture of vessels) and increased its military presence to protect the²⁷ interests of both the lessees and the government.

Throughout this period the level of employment varied from levels of fifty-two and less, to a workforce of near one hundred, including overseers, in the Sydney mines. The system of working the mine was a form of contract work based on the total production of coal, although it is not altogether clear whether it was based on tonnage, length or volume of coal²⁸ removed. Such contracts were either of four-month or one-year duration.

*chaldron: a measure for coals, approximately 36 bushels.

Generally, such contract workers were unskilled at mining, and this, combined with the lack of interests of the lessees in increasing capital with leases of such short duration, resulted in a rather high loss of recoverable coal. (Approximately half of the total possible coal that could have²⁹ been recovered was actually recovered from the seam.) Further, such neglect on the part of the lessees tended to worsen the already squalid conditions of the miners, where workmen worked from 5:00 a.m. until 7:00 p.m. with an allowance of one hour (at 9:00 a.m.) for breakfast and again (at 1:00 p.m.) for dinner. Besides wages, the miners received a weekly ration of beef, pork, bread and molasses. The dwellings consisted of two barracks (cook-rooms) housing forty to fifty men each in bunks, and serving as a place where they ate, slept and washed. Under such a system of management and operations the mines appeared to have fared little better³⁰ than under the French.

The leasing of the coal mines in Cape Breton, along with certain lands on the mainland, to the General Mining Association began a new period in the operation of the coal mines. Whereas previous leases were of short duration, the General Mining Association's lease was for sixty years.

The General Mining Association, organized by Messrs. Rundell, Bridge, and Rundell, the late well-known firm of jewellers and goldsmiths, purchased, not only extensive mining tracts in Brazil and Colombia, but also a lease of all the mines and minerals of the provinces of Nova Scotia, which George IV, by an act of the royal prerogative, had granted to his brother, the late Duke of York. Frequent rumours had, from time to time, reached England of the existence of rich veins of copper ore in Nova Scotia, which probably induced the duke to apply for a lease, in the hope thereby of repairing his damaged fortunes at all events, the duke obtained a lease for sixty years of all the reserved mines, with certain exceptions, . . . and transferred it to Messrs. Rundell, Bridge and Co., upon their

agreeing to pay over to him a certain share of the profits which should accrue from year to year. By this prudent arrangement the Duke of York, who had not the means of working the mines on his own account, secured for himself a share of the profits without the risk of incurring any loss whatever.³¹

Under the terms of the lease, the General Mining Association was allowed to sell 20,000 chaldrons of coal upon payment of a fixed rent of £3,000. sterling a year, "and that they should pay two shillings Halifax currency (equal to one shilling seven pence sterling) per Newcastle chaldron upon all coal sold over that quantity". In 1845 this provision was increased to 26,000 chaldrons, but small coal was no longer exempt from royalties. The basic agreement of the lease lasted until 1857, when the lease was re-negotiated, and the General Mining Association surrendered their claim to
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all mines and minerals except coal within certain defined limits.

With all mines and minerals under the possession of the General Mining Association, the production of coal in Cape Breton ceased to be a haphazard undertaking, as the company introduced machinery and, for the time, modern methods. In developing the Sydney mines (in 1830) a shaft was sunk, intersecting the seam at a depth of 200 feet and at a point 250 yards "down-dip" from the original workings (where the coal seam had out-cropped). This shaft was equipped with two steam engines, a thirty horsepower engine for raising the coal, and a twenty horsepower engine for pumping out water. The workforce also changed substantially as unskilled miners were no longer used, but rather a more permanent workforce was contracted both for mining, and for working in the surface installations and
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workshops associated with the mine. This shaft was followed, in 1834, by a shaft of 320 feet in depth, equipped with an eighty horsepower pumping engine and thirty horsepower winding engine, and in 1854 by a third

shaft of 400 feet in depth with "a pumping engine of 150 and a winding engine of sixty horsepower". These facilities served as the basis of the General Mining Association's Sydney area operations until 1857, when its lease was renegotiated, a point about thirty years prior to its expiration. 34

While coal mining was being undertaken in Nova Scotia under the control of British interests, there also continued to operate, and in other areas develop, a fledgling iron industry after the fall of New France. The forges of St. Maurice continued to operate under various companies through a system of sixteen-year leases, beginning in 1767. Under this arrangement the forges were operated with some success, supplying the Canadas with a large proportion of its ironware needs.

In 1831 the establishment consisted of every convenience, furnaces, forges, foundries, workshops, houses, and other buildings. Supplies to be used in the Province, such as large potash kettles, machines for mills, various kinds of casts, a superior quality of wrought iron, were the principal articles manufactured, and a quantity of pig and bar iron was produced for exportation. Two hundred and fifty to three hundred men were employed in the works. Of these the overseers and employees in the model department were English and Scotch, and the unskilled workmen generally Canadian. ³⁵

The forges, while having a number of owners, operated under a similar system to that which had existed under the French, although, as mentioned above, the composition of the workforce changed with respect to the national background of the workers. This, in part, appears related to the attempts by British and English Canadian merchants and entrepreneurs to operate the works, particularly under the directorship of Matthew Bell, who held the lease on the forges from 1798 until his death in 1845. 36

After this period the forges passed through a number of hands, and, with a combination of dwindling reserves of bog iron ore and charcoal, along

with poor management and obsolete equipment and organization, the works
 37
 finally closed in 1883.

While the forges were operating in Lower Canada during the period prior to 1840, in Upper Canada, attempts to produce iron locally took place in three separate areas: Lyndhurst, Normandale, and Marmora. The earliest attempt occurred at Lyndhurst, in the county of Leeds, about the year 1800 "by a company composed of Ephraim Jones, Daniel Sherwood, Samuel Barlow,
 38
 and Wallace Sutherland. However, the operation, in which water power was used to drive the machinery and work the blast", did not proceed past the trial stage, and was abandoned because of problems in quality of ore and final product, transportation, and in the ability to obtain a skilled
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 labour force.

The second attempt to develop an ironworks took place at Normandale, in Norfolk county, in 1815. These works were somewhat successful, although not under the original proprietor. The works, originally started by John Mason, an Englishman, ran into initial difficulties in regard to having to experiment in order to find the best method of working the ore, as well as obtaining sufficient supplies of ore (the ore bodies being scattered), and skilled labour. The lack of skilled labour was particularly crucial
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 since it only aggravated the problem of finding a suitable smelting method. Further, what skilled labour was available Mason found to be somewhat "independent":

I asked government to pay the passage of five or six families, from England, to work in the furnace. This could not be granted Another thing against me is, that there is not a man in the country, that I know of, capable of working in the furnace. But the greatest difficulty I have to overcome is, iron-men, as we call them, are the very worst sort of men to manage,

colliers not excepted. Not one of a hundred of them but will take every advantage of his master, in his power. If I have just the number of hands for the work, every one of them will know that I cannot do without every one of them; therefore, every one of them will be my master: anxiety and trouble will be the consequence: and if I keep more hands than are necessary, so as to have it in my power to turn those away who will not do right, this will be expensive.⁴¹

In 1820 Joseph Van Norman, in partnership with Hiram Capron and George Tilson, took over the works and operated them with some success from 1822 until 1847, when the furnace was shut down because of a scarcity⁴² of ore. As to the source of skilled labour associated with the enterprise during this period, little is known.

The year 1820 saw the establishment of one of the more well-known attempts at an iron industry in Canada, with the building of the works at Marmora, in Hastings County, by an individual named Hayes.⁴³ Because of heavy losses incurred by Hayes in his attempts to undertake operations, however, the works passed into the hands of the principal creditor, Hon. Peter McGill. The works were then operated sporadically, and at a loss, in the interests of McGill, until 1847, when they were purchased by Joseph Van Norman after the closing of the Normandale property. During this period McGill sought a loan of £10,000 from the legislature in order to carry on the works, "and, in 1831, upon the petition of Messrs. Hetherington, McGill, and Manahan", an act was passed to incorporate the Marmora⁴⁴ Iron Foundry. In 1839 the government took an interest in the works with a view of purchasing the works and moving the penitentiary from Kingston to Marmora, whereby convict labour would have been used to mine and smelt iron. A commission was appointed (consisting of A. Manahan and G.A.⁴⁵ Ridley) to study the feasibility of such an undertaking. The government,

however, did not proceed any further on the matter, and the works remained in the possession of McGill until sold in 1847.

The iron-works of Marmora were quite extensive, employing in 1826 thirty-five men and consisting of two furnaces, a casting house, bellows house, wheel house, and a number of supporting works (such as: grist mill, saw mill, etc.). In 1838 the value of the works was assessed at £23,770 46 0s 0d, including 14,000 acres of mineral and timber lands (for charcoal). While such a works existed, it never attained any substantial level of production during this period. Although distance from a port (Belleville) was a contributing factor to the high costs incurred, the works were operating with antiquated methods, and combined with a general lack of skilled iron-workers. It faced excessively high costs.

The parties who have had charge of the works have been constantly behind the age they lived in. When, through the agency of the hot blast, and new methods of treating the ore, the cost of manufacturing cast iron had been materially reduced in Britain, the old mode of smelting by means of the cold blast was attempted here, as well as the manufacture of bar iron, without the aid of any other machinery than the hammer, the anvil and the bellows. Under such circumstances it is not surprising that the proprietors of the works could not compete with importers or British iron masters, who carried on their operations by means of the most improved machinery, with large capital, and coal at an almost nominal price. The attempt, however, was persevered in manfully, till many thousands of pounds were sunk by the proprietors. This, however, could not last, and the works were closed.⁴⁷

Prior to 1840 there were two endeavours made to produce iron in Nova Scotia. In 1825 "the Annapolis Mining Company was formed with a capital of £100,000 to manufacture iron at Clementsport, in Annapolis County". This operation, which consisted of "a large smelting furnace, coal houses, and stores" which were built at a cost of £30,000, was undertaken with the provision of a single liability clause in the company charter

to protect the shareholders, along with government generosity in the form of "two bounties of £600 each for the manufacture of a certain quantity of pots, kettles, and bar iron. In spite of such protection and generosity, the company was unsuccessful, particularly since it "employed inexperienced⁴⁸ and unskilled men, not practically acquainted with the manufacture of iron". A second endeavour was undertaken in Nova Scotia at Pictou under the auspices of the General Mining Association in 1829. However, like the Clementsport works, this operation did not succeed, in part because of problems of smelt-⁴⁹ ing, combined with the general inexperience of most of the work-force.

Before 1840, the development of mining in Canada was strictly around coal and iron. Such development, with the exception of the General Mining Association in Nova Scotia, was of a rather primitive character, with a low level of technological innovation; in certain cases the process involved the application of out-moded methods as compared with developments in Great Britain and the United States.

Mining during this period was representative of the early stages of the transition toward the capitalist mode of production. In the mining and smelting of iron, operations were of a manufactory nature with small operations, the largest being the St. Maurice forges with a workforce under⁵⁰ contract approaching three hundred men at one point. Under the French, coal mining was little more than grubbing and primitive forms of quarrying undertaken essentially by petty producers. A system of leasing and contract work existed in the coal mines after Cape Breton passed into the possession of Great Britain, until the granting of the General Mining Association lease. The operations of the General Mining Association at this point represented the furthest advance of the capitalist mode of

production, since coal mining ceased to be undertaken in a haphazard way. The organization of the work force did not, however, change fundamentally, but remained in the form of contract-labour, although the composition of the work force changed as skilled miners replaced the unskilled work force prevalent in the mines prior to the General Mining Association.

While mining during this period was of a transitional nature, it was dominated by feudal-absolutist and mercantilist interests through their domination of the state. Under the French, as Ryerson has demonstrated, the development of the capitalist mode in Canada was frustrated by a system of colonialism which discouraged "the establishment of industries in the colonies", in combination with the overall dominance of the feudal monarchy which was, when the forges of St. Maurice were being opened, increasingly⁵¹ coming into conflict with the developing bourgeoisie. Similarly, under the British, such development was initially dominated by a mercantilist colonial system, but unlike under the French, there occurred a "passage in Britain from the dominance of an alliance of landowners and great merchants to that of the new industrial bourgeoisie", so that, by 1840, the industrial bourgeoisie was becoming dominant in Britain. In Canada, after the conquest by Britain, the dominant or ruling group consisted of a triple alliance made up of the British colonial officials, English-Canadian merchant-landowners, and the French-Canadian clergy and seigneurs, a ruling class which was representative of the colonial-mercantile system of Britain. However, the forces of change associated with the Industrial Revolution in Britain influenced the colonial system and ruling groups within the colonies, with forces of change emerging in the colonies, becoming a challenge to⁵² the ruling alliance. Toward the end of this period such forces were

arising in Canada, forces in the form of an emerging industrially oriented bourgeoisie. Such a transition was occurring in mining, as well as in a number of other sectors, including manufacturing, although, particularly in mining, it was slow and, therefore, over-shadowed by the expansion of transportation networks between 1840 and 1890.

The Development of Mining Between 1840 and 1890

While British North America, prior to 1840, was a mercantilist-landowner dominated society, within this environment there was developing the force of indigenous industrialism, both in secondary manufacturing and in primary industries. In the 1840s there occurred a similar sudden expansion of interests in mining enterprises. The roots of such industrial endeavours existed, however, prior to 1840, as illustrated by petitions for a geological survey of the Canadas. In January 1832 a petition by Dr. Rae for a geological survey was read in the Legislative Assembly of Upper Canada, but was not considered by committee. This was followed by a similar petition in December 1832, from the York Literary and Philosophical Society, which also was not considered. In February 1836, on a motion by W.L. MacKenzie and seconded by Mr. Durand, Messrs, R.G. Dunlop, Gibson, and C. Duncombe were named to a select committee to consider and report on a plan for a geological survey. The motion was referred to committee but not considered. In November 1836 a bill introduced by R.G. Dunlop, calling for a geological survey was presented, but was not proceeded with. At the same time, on a motion by Dunlop, seconded by Col. Prince, the house went
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into committee of the whole to consider the expediency of such a survey. No further action was taken on a survey until July 1841, when, in the first United parliament, a petition from the Natural History Society of Montreal

was presented to the Hon. B. Holmes, calling for a geological survey. The petition was referred to a select committee composed of Messrs. Holmes, Nielson, Quesnel, W.H. Merritt, and the Hon. Mr. Killaly, but was not reported on. Later that same year, a similar petition by Mr. Black of the Literary and Historical Society of Quebec was read. The government took up the matter, and on the motion of the Hon. G.B. Harrison, the sum of £1500 sterling was introduced into the estimates for the purpose of a survey. In 1842 Sir Charles Bagot appointed William Logan and Alexander Murray to carry out such a survey, beginning May 1, 1843. Under the administration of the Hon. Mr. Draper, in March 1845, a bill was introduced and supported by all parties making provision for the sum of £2000 per annum for five years, to complete the survey (8 Vic. Ch. 16).⁵⁴ While all parties supported the survey on principle, certain differences existed on how it should best be undertaken. Although the majority supported a general survey of the provinces, certain members, led by W.H. Merritt, complained about the lack of practical results from a survey done in such a fashion. Merritt claimed that, instead of surveying the strata, it would be more feasible to explore existing mines in order to get at their contents.⁵⁵

During 1845 in the Nova Scotia Assembly, discussion arose about the constitutionality of the General Mining Association. Among the reasons were that the Association's monopoly prevented the development of the provinces' resources. Such discussion occurred every year until 1852, when it was resolved to adopt a more pacific course. "In the sessions of 1852, 1854, and 1855 resolutions were passed outlining the Governor and Council to open negotiations with the General Mining Association for the purpose of ascertaining upon what terms the latter would agree to surrender their

claims to all the mines except those they were working." This eventually resulted in the surrender by the Association in 1857 of all mines except
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those coal mines which they were working.

While efforts were being made in the Legislative Assemblies to improve the conditions for industrial development (including mining), beginning in the 1840s there occurred an expansion of mining, highlighted by a series of rushes across the country and involving a variety of minerals. Such expansion involved a number of regions, of which the more prominent were: (1) the copper, silver, and gold mining regions of Lake Huron and Lake Superior, including North-Western Ontario, (2) the iron and lead mining regions of Eastern Ontario, (3) the copper and placer gold mining regions of the Eastern Townships of Quebec, (4) the coal, gold, and iron regions of Nova Scotia and New Brunswick, and (5) the coal and gold regions of British Columbia.

In 1844-1845 the shoreline of Lake Superior and Lake Huron was the scene of the first of a number of mining rushes to occur in what would become Northern Ontario, with a search for copper, complementing a similar rush in Northern Michigan. By 1846 a number of mining locations (of an area of two miles lakefront by five miles in depth) were taken out by individuals, many in the name of mining companies and associations. A number of the locations were in the names of prominent merchants, bankers,
57
and businessmen, although most of them never viewed the land. This was, in part, a result of the method of tendering locations, which allowed for the licensee(s) to have an agent represent his (their) interests in the
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field, including exploring and opening up the deposit.

The earliest attempt at mining in the Upper Lakes Region was made by the British North American Mining Co., which consisted of American and English-Canadian capital, headed by Col. John Prince of London, C.W., at a location on Prince's Bay and adjoining Spar Island on Lake Superior.⁵⁹

In a report to the directors, Captain John Tregonning, the agent at the mine, suggested that if operations were developed, a work force of thirty miners would be required (half of them Cornish, and half Canadian), with payment in the form of contract work (either tribute or tutwork), since it would be an incentive for the miners to work.⁶⁰ The works, however, were not developed, apparently because of insufficient funds, and the company became involved in a number of attempts to re-organize, or else leasing or selling the property outright, between 1860 and 1910, when the company charter was surrendered.⁶¹

Within the following year, a number of companies were formed to explore and develop mines along the Lakes; among them being the Upper Canada Mining Co., Montreal Mining Co., Quebec and Lake Superior Mining Association, British American Mining Co., Canada Mining Co., Philadelphia and Huron Mining Co., Garden River Copper Co., Huron and St. Mary's Copper Co., Lake Huron Silver and Copper Mining Co., British and Canadian Mining Co. of Lake Superior, and the Echo Lake Mining Co.⁶² Of these companies, two are of particular interest. The Upper Canada Mining Co., the shareholders of which included G.B. Tiffany of Hamilton, and later Sir Casimir Gzowski as a director, held eight locations, three on Lake Huron and five on Lake Superior, including the Wallace Mine on Lake Huron near Whitefish Falls. The company, formed with a capital of £100,000, attempted to bring this copper-nickel mine into production. In order to do so, the

Superintendent at the mine, O.B. Dibble, recommended that an agent be sent to Europe so that by the following year (1848) it would have in its employ six Cornish miners plus a captain, and four German miners with a superintendent (for purposes of reducing the ore), plus hiring in Canada twenty to thirty labourers to clear the site and perform surface work, two smiths, and a small crew to continue exploration work. The total work force being suggested was approximately forty to fifty men. It appears that this recommendation was not acted upon, since in the following year the work force consisted of sixteen men, and the mine ceased operations in 1849.⁶³

Possibly the most successful of the early copper producers in this region was the Montreal Mining Co. The company, which held eighteen mining locations on Lake Superior, was formed by a number of prominent Montreal and Upper Canadian businessmen and merchants, led by the Hon. Peter McGill and Hon. George Moffatt.⁶⁴ While eighteen locations were originally held by the company, the only operations undertaken besides exploratory work were the Bruce Mines and Copper Bay locations on Lake Huron, which the company purchased on the advice of their manager, Captain Roberts in 1847 for the sum of £40,000 Halifax currency. After purchasing "this property the stock was raised from 40,000 to 60,000 shares of £5 currency each, and the whole energies and means of the company were thereafter concentrated on the Bruce Mines".⁶⁵ Beginning in 1848, the company operated the Bruce mine until 1864, which it sold to the Western Canada Mining Company, along with the Wellington mine which had been leased by Western Canada Mining Co. since 1854. The operations of the Montreal Co. were fairly extensive and in 1849 the workforce "consisted of seventy-seven miners, sixty-five labourers, four boys, eleven blacksmiths, carpenters and other artisans,

two mining captains, one engineer, two clerks, and one superintendent, giving a population, including the families of the workmen, of about ⁶⁶ two hundred and fifty souls". During this period the mines were being worked by a contract system based on the systems used in Cornwall, which, at times, appeared to have caused (in the eyes of one company official) production problems. As a result, the manager initiated a modified form of the tribute system to replace the tut-work system previously in existence:

Hitherto the miners had worked under what is known in Cornwall as the 'tut-work' system. Under this system they are paid according to the ground cut, but have no interest whatever in the ore. The other system is that under which the miners are paid so much a ton of the dressed ore. In Cornwall it is called working on tribute, and the system under other names and modifications is adopted in many mines elsewhere. The 'tributer' is deeply concerned in the richness of the veins; and while it is his interest in common with his employer to avoid all waste of ore, it is not his interest unnecessarily to excavate or stope away the wall rock or barren and unproductive portions of the vein. This system I was determined, if possible, to introduce.⁶⁷

The introduction of this system in 1852 resulted in the refusal of all but a few miners to take bargains, although the manager went through with the policy, "with the approbation of the president, then Mr. Hugh Allan".⁶⁸

In 1854 an English company entitled the Western Canada Mining Company obtained a lease to the Wellington property of the Montreal Mining Company, adjoining the Bruce Mine, and then proceeded to obtain a lease on the Huron and Copper Bay property adjoining the Wellington Mine on the west. When the leases came open in 1864 the Western Canada proceeded to buy all the properties including the Bruce Mine, and worked them until 1876, when operations ceased. The work force of the company reached as high as "350 employed, some being boys". Of this "200 men were in underground mining", and being paid by contract, with wages about \$32 or \$35 a ⁶⁹ month". Such contracts were in the form of tut-work.

I cannot say what it cost per ton to mine. We generally paid about \$35 a fathom the ordinary width being 10 or 12 feet; where wider are paid more. It would cost about \$1.50 for stoping, and then there was the driving and sinking besides, which costs much more.⁷⁰

The mine eventually closed in 1876, with work being carried on by small parties of tributers during the last year.⁷¹ During their existence, however, the mines produced 40,515 tons (21 cwh) of copper, valued at \$3,300,000⁷² between 1847 and 1875.

In the 1860s the occurrence of silver in the Thunder Bay area attracted the attention of numerous entrepreneurs and capitalists. By 1870 a number of deposits around the bay were being developed, the principal mines apparently being the Thunder Bay Silver Mine, the Shuniah Mine, 3A Mine, Jarvis Island Mine, McKellar Island Mine, and the Silver Islet Mine.⁷³ Much of the capital involved with the mines was from English and American sources, as in the case of the Silver Islet Mine.⁷⁴ However, some prominent Canadian capitalists also took an interest in the silver mines, as in the case of the Thunder Bay Silver Mining Co. In 1876 its directors were Sir Hugh Allan (chairman), Thomas Reynolds, George Stephen, George A. Drummond, Hon. Donald A. Smith, James Rose, John McIntyre, and Peter McKellar.⁷⁵ Among other shareholders was Isaac Buchanan, holding eight hundred shares.

Of all the silver mines, the Silver Islet was the most famous, having operated from 1871 to 1884, in which time over \$3,500,000 worth of silver was produced.⁷⁶ This mine, originally the property of the Montreal Mining Company, was purchased by an American syndicate, headed by Major A.H. Sibley of New York and Captain W.B. Frue of Detroit, for \$225,000. (Included in the purchase were the seventeen other locations on Lake Superior which were held by the Montreal Mining Co.). The syndicate, under the

title of the Ontario Mining and Lands Co. (Inc. 1872, Ontario) obtained the property on September 1st, 1870. On February 21, 1872, it was turned over to the Silver Islet Mining Co. of Silver Islet, Lake Superior (Inc. in New York, with a capital stock of \$6,000,000).⁷⁷ With the transfer the Silver Islet Mining Co. received all mining plants and stores on the island and mainland at the Silver Islet locations, plus 60% (\$60,000) of the capital stock of the Wyandotte Silver Smelting and Refining Works,⁷⁸ which was originally established to smelt and refine the Silver Islet ores. In 1876, because of financial difficulties, there was a corporate re-organization, in which all the lands of the Ontario Mining and Land Co. and property of the Silver Islet Mining Co. was purchased by the Silver Islet Consolidated Mines and Lands Co. (Inc. in New York, with a capital of \$1,000,000 at \$25 per share), a company formed by three of the directors⁷⁹ of the Silver Islet Mining Co.

In the operations of the Lake Superior silver mines, both contract forms of labour and time-work were evident. At Silver Islet, miners were paid by the month, at \$60 per month and paid \$14 for board, while labourers received \$40 per month, out of which they paid \$14 per month board. This was based on an eight-hour day. This was possibly the highest level of wages in the region, mainly a result of the conditions at the mine and the problems the management had in obtaining and keeping miners and labour-⁸⁰ers, some of whom would leave to work in mines on the mainland. Other mines, such as the Beaver Mine, which was started in the early 1880s, paid miners \$2 to \$2.25 per day and labourers \$1.50 per day for a ten-hour⁸¹ shift, with the miners working by contract. Similar levels were being paid at the East Silver Mountain Mine.

We have 45 men working now, 24 of whom are working underground. We pay miners from \$52 to \$65 per month--\$52 by the day and about \$65 by contract, and to outside men we pay \$45. For drifting by contract we pay from \$5 to \$14 a foot, the men paying for caps, fuse, powder and candles. Our drifts are about six by seven feet. In the slate the drifting costs about \$5, but where the vein is massive we pay about \$14.⁸²

While silver and copper deposits were being exploited in the Lake Superior and Lake Huron regions, in other regions of Ontario, particularly Eastern Ontario, mines were being developed. Unlike the Upper Lakes region, where mining was the domain capital, in Eastern Ontario during the 1880s mining reflected the existence of both the capitalist and petty commodity modes of production.

In the production of phosphate rock, a raw material used for making chemical fertilizer, there existed a number of large producers, shipping their production to markets predominantly in Europe, and increasingly the United States.⁸³ In addition, there existed a number of petty producers, farmers supplementing their farming livelihood by producing phosphate from small pockets of ore on their land. These small producers sold their production to either the large mining companies or to agents (middlemen). The mining methods of the farmers, however, raised a number of complaints and problems for their buyers, resulting in the eventual decline of the small producers.

There are some small locations worked by farmers, who mine the phosphate in small veins and throw in a lot of dirt with it We cannot handle farmers' phosphate because they will not mine it carefully. To ship to Europe at the present time, it has to go 80 percent, to make it a profitable business.⁸⁴

also,

There is a great deal taken out by farmers who do not understand anything about mining; they leave a great deal of dirt in it and that has given Ontario phosphate a bad name.⁸⁵

and

When the price was high a great deal of the phosphate was taken out by farmers themselves and they still take out a little, but I don't think they mine intelligently.⁸⁶

Besides the petty producer, there existed a number of larger producers who marketed the phosphate either directly themselves, or through agents (middlemen) such as George Richardson of Kingston.⁸⁷ Among these large producers, of significance was the Anglo-Canadian Phosphate Company, of Liverpool, England, which operated a mine in the township of North Burgess.⁸⁸ In its operations the company had followed the practice of the contract system, which also had caused some problems.

We employ from 15 to 30 men. I think the contract system is the better, and we have now gone back to it. It is much better in many respects, owing to the deposits being so scattered that it is difficult to superintend the men. The objection to the contract system is that the quality is apt to be less good and the work requires careful watching. When working by the day we paid \$1.25, and by the contract \$6 a ton. It varies, of course, with the depth. For surface work we were paying \$4.50 a ton, at a depth of 70 or 80 feet I paid about \$5.50. It is difficult to get men to work at a depth, and when they get to about 30 feet they seek a new pit. When they follow a vein they just gouge the mineral out, and when we come to work it again we have to do some dead work to get it fit for working We generally employ in one pit a gang of four or five men. One-fifth of a ton a man is generally considered about the average work. Five men will take out about a ton a day where they are at all successful.⁸⁹

The other phosphate mines employed similar numbers of miners, generally by contract. While phosphate mining by itself appears to have been rather insignificant, when combined with the small amount of gold mining, and a rather extensive iron mining industry, the region was an important mining area.

Whereas phosphate mining displayed a combination of petty production and capitalist production, in iron mining the capitalist mode was totally dominant. Production was carried on mainly by a few large companies, some of which were attached to local railways and composed of capital predominantly from Canada and the United States.⁹⁰ Of these producers two deserve particular attention: (1) the Kingston and Pembroke Company, and (2) the Central Ontario Railway. The Kingston and Pembroke Company, organized in 1888, with a capital stock of \$4,000,000, seven-eighths of which was owned by American interests, operated a number of mines near the route of the Kingston and Pembroke Railway. This railway had interests in three mining companies, the Mississippi, the Levant, and the Kingston and Pembroke. Of these companies, the Mississippi (organized in 1880) and the Levant (organized in 1881) were no longer in operation by 1890, while the Kingston and Pembroke had taken over their properties, along with that of the Zanesville Mining Company which was merged into the Kingston and Pembroke in 1887.⁹¹

The Central Ontario Railway, like the Kingston and Pembroke, represented a direct link between railway interest, mining, and steel manufacturing interests in the United States. However, just as important, if not more so, it was also one of the predecessors of the International Nickel Co. Ltd.

The production of iron ore in Eastern Ontario generally accounted for a larger labour force than did phosphate mining, with as many as 150 men working in the Williams mine of the Kingston and Pembroke company.⁹² In the other mines work forces of twenty to thirty-five were common.

Between 1845 and 1890, in the Eastern Townships, there developed both petty commodity and capitalist modes with respect to mining. There occurred in the 1850s and 1860s a fair amount of placer gold mining in the watershed of the Chaudiere River, but it never achieved the stature of the Fraser River gravel bars, which were being worked at approximately the same period. In the region the deposits were worked by a few companies, as well as by numerous petty producers. Initial development in the region was undertaken by the Canada Mining Co. in 1851-1852, when they acquired the services of Richard Oatey to superintend their operations. Under his supervision, six to eight miners were employed in working the gold deposits with the Cornish system of working alluvial tin gravels.⁹³ These operations were abandoned in 1852, and from then until the 1880s, when the working of the streams all but ceased, the largest part of the mining was done by petty producers, either on their own claims, or on claims leased from other holders such as large mining companies. Such petty production involved predominantly panning and rocking, then, later, excavating the gold-bearing gravel by way of pits, shafts, and tunnels, then washing it⁹⁴ in sluice-boxes.

At approximately the same time, in this region, there was being developed a number of copper mines, particularly during the mid-1860s,⁹⁵ when forty-seven mining companies were incorporated between 1863 and 1865. While not all of these companies developed producing mines, rather substantial levels of production were reached by the English and Canadian Mining Co., which employed a work force of fifty men, and the Acton Mine⁹⁶ which employed a work force reaching between 500 and 600 in 1863. A third important producer in the region, the Orford Nickel Company, of

Orford, Quebec, was organized by W.E.C. Eustis, a Boston capitalist,
 97
 later merged into the International Nickel Company.

In the Maritimes, during the period between 1845 and 1890, three developments dominated mining; all of them in Nova Scotia: (1) coal mining, (2) the opening of the Nova Scotia gold mines, and (3) the development of iron ore in the Londonderry area. While mining was being undertaken in New Brunswick, it was on a small scale when compared with the developments in Nova Scotia. Like Nova Scotia, however, much of the activity was associated with coal mining and iron works. The Albert Coal Mines, in 1864, employed 100 men while producing sixteen to eighteen thousand tons of coal. The miners averaged from \$16 to \$40 a month, while working under contract. Besides the Albert Coal Mines, iron was being produced in the 1860s by the Woodstock Charcoal Iron Co. at Woodstock, New Brunswick. The total work force associated with this operation averaged between 150 and 200, of which forty were employed in procuring ore, ten horses and drivers to deliver the ore to the furnace, fifty men employed in the reduction of the ore, and the balance of the work force
 98
 involved in providing fuel (wood and charcoal).

Beginning in the late 1850s, there developed along the Atlantic Coast of Nova Scotia, near Halifax, a number of gold mines. Production from the goldfields continued until 1947, when the Caribou mine, then
 99
 owned by Cominco, was exhausted. The discovery of the gold fields in Nova Scotia sparked a rush that, while not of the calibre of either the California or British Columbia rushes, led to a substantial amount of production. As an example, in the five-year period from 1862 to 1866 inclusive, in Nova Scotia there was a total of 91,958 oz. 10 dwt., 16 gr.

of gold produced, while an average of 710 men were employed in the goldfields during the same period. The development of the goldfields was fairly widespread, even at this early period, as mines were being worked in over
100
twelve different areas centering around Halifax.

In 1900 the goldfields produced 33,954.663 oz. of gold, the peak period of production being between 1895 and 1903, although similarly high
101
levels were achieved from 1865 to 1868, and from 1888 to 1891.

In the early development of the gold mines the sources of capital came from a number of sources besides Nova Scotia; of the foreign sources, Boston, New York, and lesser so, the Canadas were the major sources. Among the capitalists involved in the mines, three in particular stand out, A.
102
Burkner, Charles F. McClure, and Carlos Pierce. Of the operations in the region in the 1860s, the largest appears to have been the Burkner Mine (inc. 1863 in Halifax). This company, the capital of which was unknown, was wholly owned by A. Burkner of Halifax, and employed a work force of 220 men. Charles F. McClure, of Boston, was a shareholder in five of the mining companies, with a combined capital of \$460,000, and a total work force of 292 men. Carlos Pierce was, similarly, a stockholder in five mining companies, with a combined capital of \$900,000, and employed a total
103
work force of approximately 100 men. Pierce was also substantially involved in mines in Upper and Lower Canada, while, at the same time, a substantial amount of stock in his Nova Scotia mines was held by Montreal
104
capitalists.

Prior to the discovery of gold in Nova Scotia, the only major mining activity involved coal, and lesser so, iron ore and smelting. The production of iron ore and pig iron in Nova Scotia occurred predominantly

at Londonderry, where the mining and smelting of iron began in 1839, and
 105
 was carried on until 1910. During the time it was in operation, the
 mines were held by a number of owners, including the Acadia Iron Co., the
 Steel Company of Canada (Limited)--not to be confused with the present-day
 Stelco, the Londonderry Iron Company, the Londonderry Iron and Mining Com-
 106
 pany and the Canada Iron Corporation. Throughout the period from its
 inception to 1890, the Londonderry works was expanded a number of times in
 attempts to develop an iron and steel industry based on the iron deposits.

In 1873 the Steel Company of Canada was formed to purchase these Londonderry and Acadia Mines and ironworks. The manufacture of steel by the Siemens open-hearth process, steel rails, cast steel, and spring steel was proposed. The company expended \$2,500,000 in prospecting for and raising ore, in building modern rotary furnaces, a melting furnace with regenerative gas furnaces, and in building houses for workmen. It also acquired the right to use the Siemens open-hearth process in Canada, built ten miles of railway from the mines to the plant, and made an agreement with the Intercolonial Railway for the right to use its lines.¹⁰⁷

Later, coke ovens were added, along with a coke blast furnace and new
 rolling mill, so that by 1879 there were ten furnaces in the plant. With
 108
 the subsequent transferrals of ownership, the works were refurbished.

Throughout the Londonderry works, both smelting and mining, the
 contract system was the predominant system of employment.

At the Acadia mines, Londonderry, ordinary labourers received from \$1.00 to \$1.30, and miners \$1.50 per day. The latter, however, were generally paid by the ton of ore extracted, and were making from \$40.00 to \$45 per month. The men employed in connection with the furnace were paid by the ton of pig iron produced, the keeper getting 25 cents and the other 20 cents per ton. This allowing the furnace to produce about 7 1/2 tons per day would be \$1.83 per day for the keeper and \$1.47 per day for those under him.¹⁰⁹

In 1889 the operations, under the Londonderry Iron Company, were still
 organized on the basis of contract work, based on tonnage and the quality

of the ore, with miners averaging \$1.50 per day, although some miners were on day-wages of either \$1.28 or \$1.19 for a nine-hour day. The work force at the mines consisted of seventy-five miners, and between 150 and 200 other hands, including boys.

While gold and iron deposits were being worked in Nova Scotia, it was coal mining which developed to the fullest, and became the dominant area of mining in the period between 1845 and 1890. As was previously discussed, prior to 1857 coal and all other minerals were the monopoly of the General Mining Association. With the renegotiation of the lease between the Provincial government and the G.M.A., the Association received exclusive rights to the most promising areas in Cape Breton, Cumberland and Pictou counties upon the surrender of its rights to the balance of the minerals in the Province to the provincial government.

In consideration of their surrender of their claims to other mines and minerals, the General Mining Association, by the terms of this new arrangement, secured an exclusive right to all the coal-seams in the following areas: namely, in the island of Cape Breton, in a tract of eighteen square miles, . . . bounded on the east by Sydney Harbour, on the West by the Great Entrance of the Bras d'Or lakes, on the north by the Point Anconi, and on the south by a straight line drawn from Stubbett's Point, in Sydney Harbour, to the head of Mill Creek, on the west shore of Boulardrie Island: in a tract of fourteen square miles, . . . bounded on the east by the shores of Indian Bay and Lingan Basin, on the west by Sydney Harbour, on the north by the seacoast from the North Head of Indian Bay to Low Point Lighthouse, and on the south by a straight line drawn from McPhee's Ferry, on Sydney Harbour, to tide water in the north-west brook of Lingan; and in a block of two square miles, . . . on the south-east side of Indian Bay, the site of the Bridgeport Mines: and in Nova Scotia proper to four square miles of coal-lands at the Albion mines, in the county of Pictou, and to four square miles at the Joggins mines, and four square miles at Springhill, in the county of Cumberland.

As a result of this agreement the G.M.A. received forty-six square miles of coal-lands, while the stage was set for the expansion of mining, both

coal and other minerals. "From 1858 to 1893 more than thirty coal mines were opened in the province, with an annual production of some 700,000 tons¹¹² in the last year." By 1873 eight coal companies were operating in Cape Breton alone, of which the General Mining Association, the Caledonia Coal¹¹³ Company, and the International Coal Company were the largest. On the mainland a number of other companies were also operating, including the¹¹⁴ Acadia Coal Company, the Albion Mines, and the Springhill Mining Company.

In the operation of the coal mines the work was generally carried out through various systems of contract. Throughout the period from 1845 to 1890 this system underwent little change, as, for example, in the early 1870s.

The following different systems of payment are adopted in different mines, and sometimes a combination of two or more of these in the same mine: by the cubic yard; by the ton; and by the lineal yard advance. At the Sydney mines the price paid is 46 cents per ton in whole, and 40 cents in broken coal, filled into the tubs, the slack riddled in the mine, and all weighed at the surface. The miners find their own powder and lights. For driving levels, & c., 80 cents per lineal yard is allowed over and above the rate paid for the coal thus extracted. The average daily work of each miner is three and a half to four tons, and in drifting, two men will advance four and a half feet per day. I am informed that it is not unusual for the men to earn from \$60 to \$80 per month. Ordinary labourers and surface hands are paid, on an average, at the rate of 85 cents per day. The rates at the other mines are regulated in the same proportion, allowing for the different methods of computation, and modifications according to local circumstances.¹¹⁵

By 1890 the Royal Commission on the Relations of Labour and Capital found little had changed in the system of contracts including the levels of payment. The patriarchal network associated with the company town was particularly evident in the findings of the commission, as the company, besides operating stores, arranged for schools and medical facilities with the

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miners paying for their operation. Within the work setting there had developed within coal mining a fairly extensive occupational hierarchy. In a number of cases the miners entered the mines as young boys and worked in a number of occupations before becoming a miner at the pit face.

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In the British colonies of Vancouver Island and British Columbia, the period between 1845 and 1890 saw the development of mining in a region which was, up until then, almost the exclusive domain of the fur trade. Such development involved predominantly two minerals, coal and gold, with the impact of the latter being unequalled in any other region of British North America during this time. In the working of the coal and gold deposits one finds the existence of both the capitalist and petty commodity modes of production, with the coal mines being operated in the interests of capital. The goldfield, conversely, was the scene of the greatest development of petty producers or "free" miners in mining within Canada prior to the Klondike rush of 1898.

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The initial discovery and development of coal in British Columbia occurred in 1849, under the direction of the Hudson's Bay Co., at Fort Rupert on Vancouver Island. This coal seam, however, was found to be of an inferior quality, and although it was worked in 1850, the site was abandoned in 1851 in favour of the coal seams at Nanaimo, which were discovered in 1850.

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In its operations at Fort Rupert the Hudson's Bay Co. employed a party of miners brought out from Scotland, and a number of Indians as ship-loaders.

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Provisions were also made by the company to bring out from Britain in 1851 "more and better coal-mining machinery, with some twenty-five practical men". With the decision to abandon the Fort Rupert deposit, all the men, plus the new machinery, were re-directed to

Nanaimo. Work on the Nanaimo coal-seams began in 1851, but it was not until 1852 that the operations were underway, with the employment of both skilled coal miners from Britain and local Indians.¹²¹

Thus it was the new industry of coal-mining taken in hand at Nanaimo by the fur company, and pressed forward with uncommon energy. Before the expiration of 1853 two thousand tons were shipped from this point, half of which was taken out by the natives. The first sent hence to San Francisco was in May of that year by the ship William. The company's price at Nanaimo was then eleven dollars; at San Francisco the coal brought twenty-eight dollars a ton.¹²²

The Hudson's Bay Company worked the Nanaimo coal seams until 1861 under the title of the Nanaimo Coal Company. Their operations, however, were not terribly successful, and in 1861 the mines were sold to English capital under the name of The Vancouver Coal Mining and Land Company, Limited. The Vancouver colliery quickly introduced new machinery from England into the mines, while sinking new shafts and building new wharves and loading facilities, which resulted in a marked improvement over the operations of the Hudson's Bay Company.¹²³ At the time of the transaction the new company, which had a subscribed capital of £100,000 in £10 shares, received property which included "6,193 acres of land, 100 dwelling-houses, stores, workshops, machinery, steam-engines, wharves, barges, saw-mill, and c."¹²⁴

The period after 1861 saw an expansion of coal production, with the opening of a number of mines throughout Vancouver Island by a variety of mining companies. By 1866-1867 the Wellington Mine of Dunsmuir, Diggle and Company was in operation near Nanaimo. In 1870 the Union Coal Mining Company took up several claims near Comox and began operations. Early in 1874 a fourth company began operations near Nanaimo, with the opening of the Harewood Mine. In 1876 a fifth company, Baynes Sound Colliery Company,

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Limited, began operations ten miles south-east of Comox. Of these coal mining companies the Dunsmuir interests stand out as possibly the most infamous of the mining enterprises. Robert Dunsmuir, with the Wellington Mine as the core, built up a monopoly in the coal mining industry of the island by the judicious cultivation of friendship among powerful politicians and capitalists. The crowning feat of Dunsmuir and Co. was the granting of the charter for the Esquimault and Nanaimo Railway in 1884.

The railway contract that was made in 1883 for the E and N Railway called for a subsidy of \$250,000 together with a liberal grant of land. The land was on the Eastern side of the island, bounded by straight lines drawn from the head of Saanich Inlet to Muir Creek in the Fuca Straits, thence West to Crown Mountain, and thence North to Seymour Narrows, and on the East by the coastline to the line of commencement, including all coal, coal-oil, ores, stones, clay, marble, slates, mines, minerals, and substances whatsoever thereupon, therein and thereunder.

The road with its equipment, was to be exempt from taxation for ten years after completion, and all material used in its construction was to be admitted free of duty. 126

The Dunsmuir coal interests, which were operated by the Wellington Colliery Company and included the Union mine at Comox, were taken over by a combination headed by Sir William MacKenzie, in 1910-1911. The new company, entitled the Canadian Collieries (Dunsmuir), Limited, had a capital of \$15,000,000. 127

Like the coal mines of Nova Scotia, the mines on Vancouver Island were worked under a system of contract similar to the tribute and tutwork systems since the miners were paid by the ton or yard while having to pay for the powder which they used. In the late 1870s, wages were at \$1.20 per ton, then were slashed to \$1.00 per ton, resulting in a strike by the miners; however, this was not the first, and certainly would be followed by numerous more strikes. 128 This system of contract continued in use into

the twentieth century, since it was a central issue in the coal miners' strikes in 1913 and 1917, along with the issue of union recognition. The miners had managed, however, to win by this time a minimum day rate of \$3.00 per day, regardless of the tonnage produced or yardage mined. ¹²⁹

From the beginning, machinery was used on a fairly extensive scale in the Vancouver Island mines, particularly in moving the coal from the mines to the docks, along with pumps and fans to drain and ventilate the mines. ¹³⁰ Working conditions, however, were, at best, terrible in the mines, since the British Columbia coal mines, between 1891 and 1919 had a total of 3,038 accidents, 866 of which were fatal and 1,245 of which were quite serious. As Scott illustrates, this represents the cost of one miner's life for every 143,000 tons of coal mined, while in 1902, British Columbia had a death rate in coal mining of 4.15 per 1000 persons employed, as compared with 3.32 in Nova Scotia and 1.29 for the British Empire. ¹³¹ Such conditions continued to exist in spite of legislation on coal mining, which had been passed in the British Columbia legislature in 1877. This act, among other things, regulated child labour and banned the employment of women underground. ¹³² Similar legislation was already in effect elsewhere, however, such as in Britain.

During the 1870s, employment levels in the mines had reached a level of 623 miners and labourers by 1875, and continued on an increase so that by 1912 3,777 men were employed. Such a work force was broken down into a fairly extensive hierarchy, both in terms of occupational categories, and along racial lines (whites, Chinese, and Indians). ¹³³ This hierarchical division was particularly advantageous to the interests of capital as it served not only to keep down wages, but also split the miners along racial lines. ¹³⁴

While coal mining was from its inception the domain of capital, the finding of gold in the gravel bars of the Fraser and its tributaries heralded the expansion of petty production in mining at an unprecedented level in British North America. The initial discovery of gold on the lower Fraser occurred in 1857, although its existence in British Columbia and Vancouver Island was known at a much earlier date.¹³⁵ The gold rush swept across the province like a wave, beginning in the vicinity of Hope and Yale, and moving up the Fraser, Thompson, and other rivers, into the Cariboo region by the early 1860s. As well, the gold miners spread out into the Okanagan, Kootenai, and Big Bend regions, and in the 1870s had reached the Finlay River, Cassiar and Stikine River regions of the northern part of the province.¹³⁶ It was the Cariboo region, however, which was the dominant gold mining area.

The gold deposits of the Cariboo were of an alluvial nature and easily worked by individual miners or small parties of miners using similar methods to those found in California. Among the methods used were rocker-ing, sluicing, hydraulic mining, bed-rock fluming, and ground sluicing.¹³⁷ Rockering and, to a lesser extent, sluicing, were the more primitive of these methods, and, therefore, particularly suited the needs of the petty producer or "free" miner.

The readiest and most primitive contrivance for washing gold is the 'rocker', which is still used by Chinamen, and a few white men, on the banks of the Fraser. The rocker is constructed like a child's cradle, with rockers underneath. This box is 3 1/2 to 4 feet long, about 2 feet wide and 1 1/2 feet deep. The upper part and one end are open, and the sides gradually slope toward the bottom. At the head is a section closely jointed with a sheet-iron bottom, perforated so as to admit of small stones passing through. Along the bottom of the rocker riffles or cleets are arranged to arrest the gold. (These are strips of wood or metal arranged after the manner of a Venetian blind.) This apparatus placed on the margin of the river, the

upper iron box is fed by one miner with earth, and by another is rocked and supplied with water. The gold and pebbles passing down to the bottom, the water carries away the latter, and the riffles detain the former. In case the gold is very fine, part of a blanket is often laid along the under box, covered with quicksilver to attract the gold dust.¹³⁸

Rockering was generally used on the gravel bar deposits found along the major rivers of the region and could be relatively easily worked by one man, unlike the other methods used. Sluicing, which was the most prevailing method in use on the Pacific, could vary in the scale of the operations. The principle involved with the sluice was basically similar to the bottom section of the rocker--in that it consisted of a box containing a series of riffles in which the gold becomes trapped. The nature of this method, while it could be undertaken by petty producers, required the movement of great amounts of water. This resulted in the producers forming a "co-operative" in order to provide water, or, more commonly, the growth of "flume" or water companies which built a network of flumes supplying the individual mine claims. As a result, the petty producers were at the mercy of the flume owners for water, and in time sluicing ceased to be a petty producers' operation as capitalists became the dominant feature of sluicing and flume operations, integrating the operations of flumes along with the sluices.¹³⁹

While rockering, and lesser so, sluicing, were operations of petty producers, hydraulic mining, bed-rock, and ground sluicing were operations requiring the outlay of substantial amounts of 'capital'--in the form of constructing flumes, waterways, dams, sluices, etc.--and involving a substantial labour-force.¹⁴⁰ Such methods came into prominence as mining shifted from the gravel bars and river banks to the river terraces, buried

channels, and river bed deposits requiring the diversion of streams.

Hydraulic mining involved basically an extension of sluicing as a series of flumes or sluices were fastened together forming a trough sometimes over a thousand feet long. This line of sluices would be built near the foot of the bank or terrace being worked while a second flume would be built at a level higher than the hill or bank to bring water to wash down the terraces by undercutting the terraces with jets of water and washing
141 the gravels into the sluices.

Bed-rock fluming, like hydraulic mining, involved the diversion of streams, but in this method it was done in order to reach the gold-bearing gravels and the nooks and pockets in the bed-rock.

In bed-rock fluming the stream is collected into the narrow wooden duct that is placed in the middle of its natural channel. When a river is said to be 'jammed', a high barrier is constructed from one side across. A small space is left between the termination of this dyke and the opposite side of the channel, for the water to escape. To preserve that part of the channel, from which the water has been diverted, dry, another barrier is formed at right-angles with the first, running parallel with that side of the river-bed through which the stream flows. The layer of clay covering the bed-rock and the crevices, and 'pockets', of the rock itself are minutely ransacked, and often with very profitable results.¹⁴²

The effect of the gold rushes in British Columbia resulted in a large influx of population, as an average of 3,220 miners were employed in gold mining between 1858 and 1875, producing a total estimated and
143 actual yield of gold valued at \$38,166,970. Just as important, however, as the individual or "free" miner was replaced by mining companies, a labour force of miners grew, providing a pool of labour for the expansion of mining in the form of lode mining in the 1880s and 1890s, particularly in the Kootenays and Columbia River basins. In spite of this general change a few individual miners continued working, particularly in the
144 Cariboo region.

During the period between 1840 and 1890, mining within Canada underwent a substantial transformation as forces were arising, associated with an Industrial Revolution--the emergence of an industrial bourgeoisie and the development and growth of various forms of wage labour (or the growth of a labour market)--in which the capitalist mode of production became dominant while the petty commodity mode declined. With the increased development of the capitalist mode of production in mining, there occurred a transition on the level of the relations of production and productive forces. Not only was the size of the productive units and labour forces increasing, but within the individual units there was developing an expanding hierarchical structure in the social relations of production, and an increased introduction and development of higher forms of technology.

In the 1840s, 1850s, and 1860s mining in Canada, while increasingly becoming capitalistic--increasingly dominated by the capitalist mode--was characterized by relatively small units of production. With a few exceptions (i.e., the General Mining Association, Silver Islet, Acton Copper Mines and the Western Canada Mining Co.), the labour forces in the mines were generally quite small; seldom numbering over fifty men, and normally averaging between twenty-five to forty mine workers (miners, labourers, etc.). Similarly, technological innovation and the application of machinery in the mines was at a relatively low level. Drilling was done by hand (use of hammers and hand steel) and the use of steam power was initially introduced for drainage pumps, then hoisting ore. Further, while Canadian capitalists were substantially involved in mining, there was a heavy dependence, both on their part and on the part of foreign capital (predominantly British and American) on imported technology and a skilled labour force throughout the whole period between 1840 and 1890.

With respect to technology, this dependence on "foreign" sources was evident in two areas: directly, in terms of mining and separating ores, and indirectly, in regard to the smelting and refining of metals.

Prior to 1890, most metals mined in Canada were shipped to smelters and refineries in the United States or Britain, although attempts at smelting were undertaken at Bruce Mines. It was not until the 1890s that any significant smelting operations were established, predominantly at Sudbury and in the Kootenays. Further, imports accounted for a substantial share of the mine machinery used, as evidenced in testimony before the Royal Commission on the Mineral Resources of Ontario. Many of the mine owners and agents complained of problems with the import duty on mine machinery, instituted under the National Policy.

Some of the machinery requisite for mining can be obtained in Canada; other parts cannot and have to be imported. I think it would be wise to admit such machinery as is not manufactured in the country at a nominal duty.¹⁴⁵

also,

The tariff works against us very much. The manufacturers of Canada are not at all up to the times in the manufacture of mining machinery, or in anything else that belongs to mining. In order to get the best we have to go to the other side of the line, and if we do not get the best it is better to not get any at all; the most modern and most improved machinery is what we want, and we must get it no matter what the duty is. The duty is 30 per cent. The candles that we use are made of mutton, tallow, paraffine wax and resin. Anything we export does not pay duty, but anything we import to improve the country pays an exorbitant duty.¹⁴⁶

and,

Our machinery at East Silver Mountain mine, with the exception of our drills, has been got mostly in Canada. Our pumps were manufactured in Toronto by Williams. I do not think if we were erecting our stamp mill that

we could get the machinery in Canada; we would have to import at any rate most of it. The removal therefore of the duty on machinery would be a great assistance to miners. What machinery we have purchased in Canada has been very good.¹⁴⁷

While imports were the major source of mining machinery, a second, and just as important, aspect of technology was the methods and skills involved with mining, a factor very closely associated with immigration and the struggle between the capitalist and petty commodity modes of production. During this period (1840-1890), immigration, particularly from Great Britain, accounted for the majority of such skilled mine workers, for at this time there was large-scale emigration of miners from Britain and particularly from Cornwall and Wales, as 59,543 miners left the United Kingdom between 1861 and 1872. The largest part of this emigration was bound for the United States and Australia, although a fair amount went to
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British North America. This demand for skilled labour was further evidenced by the endeavours of mine owners in obtaining labour from Britain. When setting up their operations, a number of mine agents specified the need for such labour, as in the case of the mines in the vicinity of Lake
149
Superior and Lake Huron.

Equally as important as immigration in terms of the formation of a skilled labour force was that the methods and social relations under which they had previously laboured were imported. Throughout most of the mines, wage labour was engaged under various forms of contract, varying, in some cases, from modified forms of tribute and tutwork--as in the case of the Bruce Mines--to contracts based directly on tonnage, footage/yardage, area
150
(square footage), and volume (cubic yardage). Such a labour force, as the capitalist mode expanded, developed into an increasingly extensive

hierarchy within the work place. In the 1840s and 1850s, a labour force normally consisted of twenty to forty men working both on surface and underground, with one overseer in charge of each part (underground and surface) and the men, with the exception of tradesmen, being divided into miners, helpers, labourers, smeltermen (furnacemen) and furnaceman's helpers; such a case being exemplified by the work force of the Upper Canada Mining Co.¹⁵¹ By the 1880s, however, with the expansion of the labour force within individual producing units, and the introduction of improved methods and machinery (i.e., steam, and later, air drills, improved hoists and pumps, new methods of recovering minerals--milling methods), the social hierarchy within the work place was also becoming transformed. As The Royal Commission on the Relations of Labor and Capital (1889) found, with respect to the Nova Scotia coal mines and the iron works at Londonderry, N.S., there existed a fairly extensive social hierarchy within the work place, an increasing division of labour. Similarly, in the copper-nickel mines opened in the 1880s near Sudbury and in the coal mines of British Columbia, a fairly extensive division of labour within the work place was occurring. Although such social hierarchies were developing, contract work was still the predominant form of wage labour, although time work (i.e., day or hourly wages) was becoming more common in areas not directly related to production (i.e., with general labourers, trappers (door-boys), tradesmen, drivers,¹⁵² and pumpmen.

While the capitalist mode of production had developed within Canada, there also developed during this period a petty commodity mode of production within mining. It was in conjunction with the gold rushes of British Columbia that the petty commodity mode developed to the fullest within

Canada prior to 1890, although petty producers were involved in mining phosphate in Ontario and placer gold in the Chaudiere region of Quebec. However, since the placer deposits required the increased use of machinery and application of higher forms of technology, the position of the petty producer in placer mining became increasingly tenuous.

The most significant development in the mining industry during the decade 1860-70 was the supercession of surface placer mining methods, wherein the individual working in informal combination had free play, by quartz mining and corporate working of deep placer diggings, wherein individualism began to be submerged and capital became uppermost.¹⁵³

The decline of the petty commodity mode in conjunction with the rising dominance of the capitalist mode is evident in the development of mining laws and regulations. In Ontario and Quebec (the Canadas), and in the Maritime Provinces the development of mining laws reflected the needs and interests of capital. Prior to 1864, with the enactment of the Gold Mining Act, mining in the Canadas was governed by Orders in Council which eventually developed into a set of regulations governing mining. Such regulations initially favoured capitalists with large amounts of capital since the prospective "miners" had to take out a location of ten square miles at 4s. per acre (80 cents), or a total cost of \$5,120.00. As a result, the regulations were modified in 1853, when the Commissioner of Crown Lands was empowered to issue licenses upon payment of \$100, allowing the holder "to take possession of a tract not exceeding 400 acres of un-
¹⁵⁴occupied land." Until 1869, when the General Mining Act was passed by the Ontario legislature, the only mining act was the Gold Mining Act of 1864 and the Gold and Silver Mining Act of 1868, both of which made provisions for the sale of gold and silver mines (monetary metals), and the collection

of royalties from such mines. With the passing of the General Mining Act, similar provisions were made for other mines besides gold and silver. This series of legislation tended, however, to favour capital since the size of claims was set at a level which tended to favour larger companies or producers. This practice was looked upon favourably by the Mineral Resources Commission of Ontario (1890), for while it recognized that the small producers' and prospectors' interests might be better served by permitting small locations (twenty and two-thirds acres minimum), the commission held that the provinces' mineral resources would be better worked by larger companies.

It may be assumed that, within reasonable limits, the larger the number of mines with separate and independent owners there are in operation upon each known lead, the more satisfactory will be the progress of mining industry in the country. But much will depend on the amount of capital that the mine-owner puts into his business, and the energy and skill with which the work is carried on. One strong company, if not hindered by a too narrow area, may employ more men and take up more minerals than half a dozen weaker concerns; and, providing that working conditions are imposed and enforced, it does not seem that a useful purpose can be served by a provision the effect of which may be to bar the profitable investment of capital.¹⁵⁵

The Mining Acts of Quebec and Nova Scotia, similarly, reflected the in-
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 terests of capital in terms of setting the size of mining locations.

The development of mining regulations and laws in British Columbia, on the other hand, reflected the conflict between the capitalist and petty commodity modes of production, particularly in regard to the gold rush of the Fraser and Cariboo regions. With the gold rush, there developed among the "free miners" a system of self-government and regulations similar to the methods developed in California with a number of these regulations in-
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 corporated into the Gold-fields Act of 1859. In 1884 the laws of British

Columbia, relating to gold and other minerals excepting coal, were consolidated and amended. The Act was further amended in 1886, 1887, and 1888. This Act made provision for larger claims or locations of twenty and two-thirds acres (1500 x 600 feet along a vein), and the sale of claims permitted larger holdings. ¹⁵⁸ Such provisions tended to favour the interests of capital at the expense of the petty producer, and in time lead to such petty producers becoming wage labourers.

With the decline of petty production and the development of the capitalist mode of production within mining, there occurred a transition within the capitalist mode. Whereas in the early part of the period (1840-1870) the capitalist mode within mining was characterized by a pattern of non-accumulation within mining--the profits from mining being paid in dividends, with a mining company lasting as long as the mine's ore body held out--toward the end of the period there developed tendencies toward monopolization and consolidation within mining. Mining companies were leaning toward integrated operations. It would be in the decades after 1890, however, that such consolidated mining companies would develop--companies such as are presently dominating mining.

The Period of Consolidation and Monopolization, 1890-1920

In the period after 1890 there developed in mining, both within Canada and elsewhere, an increasing trend toward consolidation and monopolization. While the small mining companies continued to exist within Canada, there also were developing mining companies of a nature like that of the International Nickel Co., Ltd. and Consolidated Mining and Smelting Co., Ltd.--precursors of the multi-national mining company. The roots of such mining companies were associated with a number of forces, among which were:

(1) general accumulation of capital within mining directly, (2) the integration of mining and smelting interests, and (3) growth of finance capital.

The discussion of mining during the period from 1890 to 1920 will emphasize the following events: (1) the Klondike gold rush, (2) the growth of International Nickel Co., Ltd., (3) the formation of Consolidated Mining and Smelting, and (4) the mining boom associated with Cobalt, the Porcupine and Kirkland Lake mining areas. In each of these regions such a process of consolidation and monopolization was occurring. While the roots of this process existed to a degree in the period prior to 1890, in the period after 1890 the process of monopolization resulted in a further introduction of advanced technology into mining, as well as changes in the social relations of production.

Of the events in Canadian mining, none had such an imprint on Canada as the Klondike gold rush, although other mining areas have equalled or produced more minerals in terms of the total value of production. This event, which Innis has described as being analogous to a cyclone because of the sudden expansion and decline of the gold rush, can very well be described as the "last-hurrah" of petty commodity production within Canadian mining.¹⁵⁹

The date of the major discovery of gold in the Klondike region has generally been set at 1896, with the resulting inflow of population¹⁶⁰ beginning in 1897 and peaking in 1898. The presence of gold in the Yukon was known as early as 1873, however, with prospectors working the Yukon basin from then onwards, particularly in the region near Circle City,¹⁶¹ Alaska and Forty Mile Creek in Yukon Territory.

Initial mining activities, as previously stated, were dominated by petty producers, most of whom entered the region in 1897 and 1898.

Placer mining began with methods used in British Columbia and California, but modified them to meet the specific climatic conditions of the region.

Creek claims are worked either by sinking and drifting, or by open-cuts. The former method was the one first employed and is still very generally used, as operations can thus be carried on during the winter. This is done either by wood fires, heating the water at the bottom of the shafts with hot stones, or by steam thawers. The latter method is gradually superceding the two former and is a very simple one. A small boiler is generally used, from which the steam is passed through rubber hose, to the ends of which pointed steel tubes about four feet in length are affixed. The latter are driven into the frozen gravels, and steam is forced through them for six or eight hours. They are then withdrawn and the thawed material, removed The introduction of the steam thawer is of recent date, and marks a great advance in the mining methods of the district In working claims by the second method, that of open-cuts the first object is to get rid of the muck covering. This is easily done in early spring by taking advantage of the spring floods and leading the water by several channels across the claim. The muck thaws readily, the streams soon cut down to the gravel, and the channels then gradually widen until they meet. In some cases the process is hastened by blowing the walls of the channel down into the stream with powder. When the muck covering is removed, the gravels soon thaw to bedrock. The upper portion, if barren, is then removed, usually by hand, and the underlying pay-gravel is sluiced in the ordinary way.

The open-cut method of working claims leads to a more complete extraction of the gold and is the one generally preferred whenever the muck covering does not exceed ten or fifteen feet in thickness¹⁶²

In setting up mining operations, claims were generally "three hundred or five hundred feet along the length of the stream and to extend from rim to rim" rather than the one hundred foot square claims of British Columbia. Such claims were allocated "along principles established at miners' meetings". In time, such claims were set at five hundred feet of stream bank. After the stream claims had been taken up and mostly worked over, activity shifted to hillside claims, and later to bench claims. With the shift

to the hillside and bench claims there arose the familiar problem of obtaining adequate supplies of water with which to work claims, sounding a further death knell to petty production in mining, as it had in the Cariboo.

The transition toward the capitalist mode occurred rather early in the Klondike; a transition in which the development of technology had a major influence. While "free miners" or individual miners worked the gravel bars, generally by sinking a shaft in the frozen earth to bedrock and drifting along the pay-streak, such operations required a number of miners to work them. As a result, the miners generally developed forms of cooperation similar to the "cost-book" and/or contracted wage-labour. The "free miner", however, was generally short on "capital" and, therefore, depended on fire-setting, rather than steam-thawing, in order to loosen the gravel.

Even in its (steam-thawing) early day this process was at least twice as efficient as fire-setting, which moreover was making heavy inroads on the available fuel. Moreover steam-pointing, was not hampered like fire-setting by the wet ground in summer. Now winter drifting, though it had the advantage of giving the individual miner more continuous work, was a relatively expensive method of working out a claim The new process of steam-pointing also enabled claim-owners to concentrate on the summer season and turn-off their wage-workers in the winter. It was hard on the wage-earning miner but it might make the difference between profitable and unprofitable working of a claim. It was part, in short, of the transition to large-scale systematic working of the less rich claims usually found in the aftermath of a gold rush. Only on the less accessible creeks did fire-setting by individual miners hold its own.¹⁶⁴

As the richer deposits became exhausted, and activity shifted to the hillsides and benches, capital was rising to the dominant position in placer mining since, as previously mentioned, the working of these deposits required the movement of large volumes of water and substantial amounts

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of capital. This shift of activity, therefore, was associated with the introduction of hydraulic mining on the benches and hillsides, while on the creek beds dredges were being introduced to re-work these deposits on a larger scale. Such methods in turn required large concessions of water and land in order to be undertaken; a situation which ran directly counter to the interests of petty producers. With the decline of petty production, a number of abandoned claims became available and were acquired by capitalists such as A.N.C. Treadgold and his associates, who, "in June 1901 secured from the Dominion Government, . . . , an extensive grant of water rights" for such large-scale mining operations. 166 The protests of the miner-prospectors were loud enough, however, to result in a Royal Commission. 167 Treadgold withdrew from the arrangement. However, "with the aid of the Guggenheims and Pierpont Morgan he organized in 1906 the Yukon Gold Company, which proceeded to acquire more claims and options and to bring water seventy miles in flume and ditch and pipe from the Twelve Mile River". 168 In undertaking such operations, the mining companies generally co-ordinated the activities on the hillsides (hydraulic mining) with those of the creekbeds (dredging).

The final stages of large-scale operations involved cooperation between work on the creek-claims and work on the hill- and bench-claims. In many cases it was necessary to work-out the creek-claims to provide a dumping ground for the tailings from the bench- and hill-claims. Extensive use of the dredge on the creek-claims precluded development of hydraulic operations and the bench- and hill-claims. The introduction of dredges . . . on a large scale in 1905 paved the way for hydraulic operations. 169

With the transition of mining in the Yukon from a predominantly petty commodity mode of production to a capitalist mode, the relationship between producers and non-producers underwent changes. Under the system

of "free-miners" that was initially the dominant form of labour, with such miners formed into partnerships in order to work their respective claims. Where such organization did not take place there developed a form of organization known as the "lay" system, which arose because of limits of the wage system and the requirements for extensive supervision.¹⁷⁰

A 'lay' is a part of an alluvial claim let out by its owner to two or more miners on condition that the miners pay all expenses connected with the mining and washing of the gold, the owner receiving half the gross output and paying all the royalty on the whole gross output. This system was widely prevalent last winter 1897-98. The lay system could not in any case be more than a mere temporary expedient designed to meet the owner's want of capital and mining knowledge, an expedient too, of use in retaining labourers when labour was scarce; with labour and supplies already greatly increased, with capital and skill both becoming available, its system dies a natural death.¹⁷¹

This system shared many of the characteristics of the "tribute" system in that the producers' remuneration was based on a percentage of the value of metal produced and determined the methods by which the gravel bars would be worked.

With the expansion of large-scale operations involving dredges and hydraulicking, and the increased dominance by capitalists, wage-labour in the form of time-work became prominent, particularly after 1900. In the period between 1900 and 1915, among the mining companies operating with such methods (dredging and hydraulicking) were the Canadian Klondike Mining Co., Bonanza Basin Gold Dredging Company, Yukon Consolidated Gold Fields, Yukon Gold Company, Boyle Concessions, Limited, Dominion Mining Co., Big Creek Mining Co., and Calder Mining Co., with the latter three being controlled by the Northwestern Corporation Ltd. (organized by A.N.C. Treadgold).¹⁷² The development of such mining companies, however, did

not match the development of the capitalist mode within mining in other regions of Canada.

While the capitalist mode of production had been developing in mining throughout Canada, in two particular regions (the Kootenay region of British Columbia and the Sudbury region) there developed two mining companies (Consolidated Mining and Smelting Co., Ltd. and the International Nickel Co., Ltd.), which were precursors of future development within mining. The two companies, although circumstances associated with their formation differ, represent the penetration of finance capital into mining.

The expansion of mining into the Kootenay region of British Columbia followed from the general expansion associated with gold mining in what became the states of Oregon, Washington, Idaho, and Montana, and in the Cariboo region of British Columbia, as placer miners and prospectors entered the region in the 1860s and 1870s.¹⁷³ Initial interest was in placer gold deposits. Interest was soon shown, however, in lode deposits which the prospectors were discovering, particularly in silver deposits.¹⁷⁴ In the 1880s a number of such lode deposits were developed and brought into production, principally by capitalists resident nearby in the United States, that is, in Spokane, Washington. These capitalists were generally involved in mining in the neighbouring states, such as in the areas of Coeur d'Alenes in Idaho, and near Butte and Helena, Montana; so that expansion into South-Eastern British Columbia constituted the expansion of a mining region across international boundaries.¹⁷⁵ It was an expansion within a topographical area which Trimble has termed the "Inland Empire".¹⁷⁶

Mining in the region began in 1886 with the discovery of silver near Nelson, leading to the opening of the Silver King Mine. By 1890

mines were being opened at Rossland (the Center Star, War Eagle, Idaho, Virginia, and LeWise--later LeRoi), Field (Monarch Mine), and Illecillewaet¹⁷⁷ (Selkirk Mining and Smelting Co.--Lanark Mine). Because of the relative isolation of the region when it first opened, the development of smelting works and transportation systems had important implications for mining in the region. While the mines were being developed in the Kootenays, the ore was shipped to smelters nearby in the U.S., such as those at Butte, Great Falls, and Helena in Montana, and Spokane and Tacoma in Washington.¹⁷⁸

It was in conjunction with the development of smelting facilities and railways that finance capital entered into mining in this region. Smelting operations began at Nelson and Trail in 1896, with the latter becoming the nucleus for the formation of the Consolidated Mining and Smelting Co., under the initiative of the Canadian Pacific Railway.¹⁷⁹ The formation of the Consolidated Mining and Smelting Co. was linked to the penetration of railways into the region with the Canadian Pacific from the north and east, and the Great Northern from the south, with the possibility of competition arising. In 1895 the Great Northern, initially being closest to the region, built a branch line to Nelson. Six years previous (in 1889) Canadian Pacific acquired the charter of the Columbia and Kootenay Railway Company, providing for a combined rail and steamer connection to the C.P.R. main line at Revelstoke, followed by the Nakusp and Slocan Railway in July 1893.¹⁸⁰ More importantly, however was the programme associated with the building of a Crow's Nest Pass Railway. In 1888 the British Columbia legislature granted a charter for the Crow's Nest and Kootenay Lake Railway Company (re-named the British Columbia Southern) to extend from the provincial boundary in the Crow's Nest Pass to the Kootenays. This charter

was not acted on by the mid-1890s, while at the same time C.P.R. was taking an interest in the same route. In 1897 it made an agreement with the Federal Government to construct the line, obtaining an outright grant of \$11,000 per mile from the federal government. Following this, C.P.R. bought up other charters and lines, including the British Columbia Southern, "the terms of which the C.P.R. fulfilled by building the Crow's Nest Pass line" and thereby picking up a land grant of 3.75 million acres and six square miles of coal lands.¹⁸¹ A second, and most important, purchase in the long-run was that of the assets of F. Augustus Heinze.

In 1896 Heinze had constructed a smelter at Trail (near Rossland) and a standard-gauge railway (the Columbia and Western) from Trail to Robson (Castlegar), later receiving a provincial charter to continue the line from Robson to Penticton in the Okanagan. In 1898 the total assets of Heinze were purchased for the sum of \$800,000.¹⁸² The smelter, a "by-product" of the agreement which became the nucleus of Consolidated Mining and Smelting, depended on outside supplies of ore, a situation which the C.P.R. remedied by buying up mines.

A smelter such as that at Trail, built in relation to ores with high gold content and dependent on relatively smaller mines, was forced to protect itself against signs of exhaustion by acquiring control of, and amalgamating mines and by introducing more efficient methods of mining, just as the Canadian Pacific Railway had been forced to assume control of the railways and the smelter as a means of reducing overhead costs. With a single direction organization in control, namely, the Canadian Pacific Railway, determined attempts were made to exploit mines systematically and to develop large ore bodies of relatively low-grade ore. The enormous overhead costs of the railway and the smelter necessitated systematic development work in the mines of the region.¹⁸³

Among the mines purchased were the Center Star and War Eagle at Rossland, the St. Eugene Consolidated Mining Co., Ltd. at Moyie and the Sullivan

Mine at Kimberley, in 1910. In 1906 the Center Star, War Eagle and St. Eugene were amalgamated along with the smelting works into the Consolidated Mining and Smelting Co., Ltd.¹⁸⁴ Mining in the Kootenays, while originally undertaken by American capital, was becoming controlled by Canadians.

The coming of the C.P.R. and the incorporation of the West Kootenay Power company marked the beginning of a transfer of control from interests centred largely in Spokane to Canadians in Montreal and Toronto, although the development of the Slocan and Boundary, which were about to be opened up, would still be left almost entirely to Americans. Further evidence of the growing Canadian interest was the purchase of the Center Star and War Eagle Mines by the Gooderham-Blackstock syndicate of Toronto.¹⁸⁵

The entrance of Canadian capital into the region occurred under somewhat different circumstances to the original development of the Kootenays. Whereas the Americans were initially involved in risk capital, the Canadians generally came in late, buying up and consolidating the mines into larger corporate bodies, of which the Consolidated Mining and Smelting Company was the most outstanding.

The entrance of such a company had a tremendous impact on the application of technology and on the social relations of production. Initial production of silver bearing ores in the Kootenay region was often a rather primitive operation, due, in part, to the isolation of the region. Machinery was, however, often introduced into the mines at a very early date, since the major mines, such as the Silver King at Nelson and the leRoi at Rossland, had installed steam-drive hoisting machinery, air compressors of ten machine-drill capacity, and tramways to a nearby smelter by 1895.¹⁸⁶ The installation of air compressors was especially important in that it replaced the rather slow and hazardous system of hand-drilling.

The great advantage derived from using improved machinery of this kind is apparent when it is stated that the progress made in a single shift amounted to four feet in the hardest rock whilst by manual labour, in the same time, but four inches would be accomplished.¹⁸⁷

With the process of consolidation/monopolization, capital became available for a systematic exploitation of mines, particularly with improved transportation, and, more significantly, milling (concentrators) processes, eventually allowing for the mining of lower-grade ores on a large scale.

Within the mines, the miners had, by 1900, achieved an eight-hour day, based on time-work. Certain mines, however, for example, the War Eagle and Center Star, attempted to overcome this situation through the re-institution of the contract system.

This mine with others was affected by changes following the introduction of the eight-hour day law on May 1st, 1899. In the spring of 1900 the three-shift system was changed to two, i.e., 7 a.m. to 4 p.m. (one hour off), 4 p.m. to 1 a.m. (one hour off), with a special blasting gang loading and firing ground drilled for working 1 a.m. to 7 a.m. (the graveyard shift). The working faces were then free of smoke for the machine men. A contract system was introduced on the basis of a price per foot of hole drilled--this being possible with the homogeneous character of the ore body.¹⁸⁸

While the mining companies tended to support the re-introduction of the contract system, the miners, led by the Rossland Miners' Union, generally opposed the system. As one miner observed:

Well there is a principle I have always found in Montana and Utah, the principle among miners is usually to condemn a competitive system of that kind because it has a tendency to put men in competition with their fellow workmen.¹⁸⁹

Such struggles would continue in the Kootenays as Consolidated Mining and Smelting Co., along with the C.P.R. dominated the region more and more.

The history of the International Nickel Company, Ltd., like that of the Consolidated Mining and Smelting Co., was linked to the building of railways, although this was indirectly. The roots of International Nickel in Canada lie in the activities of a number of American capitalists involved in mining in two separate areas of Canada--the Eastern Townships of Quebec and Hastings County, Ontario.

In 1878 the Orford Nickel and Copper Company--capital \$300,000--was organized by several American capitalists to work a mining property in the township of Orford, Quebec. The mine, it turned out, contained nickel as well as copper. The company then built a smelter and refinery near Bayonne, New Jersey in order to process the Orford ore. In time the smelter and refinery became the most important assets of the Orford company, for, by 1890, the mine was exhausted, and the company was solely process-
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ing the ores of other mining companies.

Parallelling the development of the Orford company, in 1881, S.J. Ritchie, a carriage maker from Akron, Ohio came to Ontario in search of a supply of hickory for wheel spokes, and, like a number of his fellow countrymen, became interested in the iron deposits in Hastings and in the adjoining counties of Eastern Ontario. Ritchie, in association with William Coe of Madoc, "secured title to some iron-ore deposits north of Trenton, and formed the North Hastings Iron Company". With the financial assistance of American and local capitalists, "including G.W. McMullen and H.C. McMullen of Trenton, and James and D. MacLaren", the "lumber-barons" from Buckingham, Quebec, the company purchased the Prince Edward County Railway in
191
order to obtain a railway charter. With the charter, Ritchie and associates formed the Central Ontario Railway, and obtained from the

provincial government, the right "to expropriate land along the right-of-way of a proposed extension from Trenton into North Hastings", a situation which enabled Ritchie to interest a group of Ohio capitalists. The Central Ontario Railway proceeded in building a line to Coe Hill, and in doing so also secured a near monopoly over the region's iron production. Because of problems with the iron deposits, however (pyrites rather than oxides), Ritchie and company embarked on a scheme to obtain a Dominion charter in 1884, to connect with the Canadian Pacific near Callander. In the meantime the railway received 54,000 acres of mineral lands, including all timber except white pine, and an option on a further 46,000 acres from the provincial government. While the company received a Dominion charter, it did not complete the extension, but shifted its attention to the Sudbury district mineral lands in 1885.

The existence of the nickel-copper deposits around the Sudbury Basin was noted as early as 1856, when it was mentioned in a report by A.P. Salter, a provincial surveyor. In 1884 the Murray brothers, Pembroke merchants, along with John Loughrin of Mattawa, a timber contractor to the C.P.R., and Henry Abbott of Brockville, obtained a patent on land in McKim township, which became the Murray Mine. This land was sold to H.H. Vivian and Company, of Swansea, Wales, with mining operations beginning in October 1889, adding a smelter in 1890. Following up the findings of Murray et al., a number of prospectors and/or speculators entered the area and a series of other discoveries were made. Among the more prominent prospectors or speculators were: J.H. Metcalf, W.B. McAllister, Thomas Frood, James Stobie, Henry Ranger, Rinaldo McConnell, Francis Crean, William McVittie, and Robert Tough.

Upon entering the district in 1885, Ritchie and associates founded the Canadian Copper Company in January 1886, chartered in Ohio with a capital of \$2,000,000. The lands purchased from J.H. Metcalf and W.B. Allister in 1885 (Creighton Mine, Copper Cliff Mine, Lady Macdonald Mine and Frood Mine) were transferred to Canadian Copper, while the lands of the North Hastings Iron Company were transferred to another new company, Anglo-American Iron Company, also chartered in Ohio, but with a capital of \$5,000,000.¹⁹⁶ Canadian Copper proceeded in 1886 to purchase a number of other mineral lands, including those held by Rinaldo McConnell (Clara-belle Mine and Stobie Mine), Robert Tough (Vermillion Mine), Francis Crean (Crean Hill), and James Stobie (Stobie Mine--held in partnership with McConnell), attempting, in the process, to obtain a monopoly over the mineral lands around Sudbury.¹⁹⁷

In 1886 Canadian Copper made arrangements with Orford to treat its Sudbury ore at the New Jersey refinery, and in 1890 Orford agreed to buy ore exclusively from Canadian Copper.¹⁹⁸

In 1890, Canadian Copper and Orford entered into an exclusive five-year supply contract to cement a combination giving both companies substantial advantages over their competitors: for Orford, guaranteed supplies of ore at known prices; for Canadian Copper, a guaranteed market.¹⁹⁹

Thus began a relationship which led to a merger in 1902, a merger resulting in the formation of the International Nickel Co., Ltd. (a marriage made in Heaven, where God is finance capital).

By 1892 Orford had developed a process to treat the complex nickel-copper sulphides of Sudbury, and, in time, R.M. Thompson, President of Orford Copper Company assumed the Presidency of Canadian Copper; a position which Ritchie lost in 1891 when his Ohio "friends" dumped him. In 1890

Canadian Copper-Orford obtained a secure market for its nickel with a 200
contract to supply the United States Navy with nickel for armor plate.

With the possession of a refining process for nickel, Canadian Copper-Orford was at a decided advantage over most other producers in the Sudbury district, since known processes for refining nickel were few, and tightly guarded by the holders of patents. Canadian Copper proceeded to freeze-out most competition in Sudbury, which resulted in Canadian Copper, H.H. Vivians, and the Dominion Mineral Company being the only producers. By 1895, however, Dominion Minerals had shut down, when the refinery of Joseph Wharton, in Camden, New Jersey, closed because of the depressed nickel market and its inability to compete with the marketing practices 201
of Orford.

While Canadian Copper was building up a monopoly position in Sudbury, Orford set out to control the nickel market, entering into price war with other producers, principally with the Rothschild's firm, Le Nickel. Beginning in 1892, this price war continued until 1895, with nickel prices dropping to as low as 20 cents per pound, from a high of 60 cents. In 1895 Orford and Le Nickel reached an agreement over prices (33 cents per 202
pound), and the division of the market. The price war had serious consequences for other producers, although Joseph Wharton's refinery continued 203
to operate because of the specialty nature of its product. In order to control Sudbury, Canadian Copper entered into an agreement with Wharton in 1897, to keep his refinery supplied with matte, similar to the agree- 204
ment with Orford.

The year 1902 saw the merger of the Orford Copper Company, the Wharton Company, and Canadian Copper into the International Nickel Company

(capital \$25,000,000) "under the control of the financial interests backing
 205
 the United States Steel Corporation" (J.P. Morgan and Company). As O.W.

Main illustrates, this merger was advantageous to all concerned:

The amalgamation had several advantages to J.P. Morgan and Company. It provided an assured source of supply for a strategic material and it placed the American armour-plate manufacturers in a strategic position to gain a share of the nickel-steel market outside the United States while reserving the armour-plate business in the United States for themselves. Also, the strategic control over financing held by the Morgan interests would enable them to block effectively any attempts to finance possible competitors either in nickel steel or in nickel. Finally, the profits which would be gained from the promotion of the new company promised to be substantial.²⁰⁶

As a result of the merger, International Nickel was the possessor of two refining processes of nickel. It still faced possible competition, however, as new companies undertook to enter the district, although nearly all of these attempts were unsuccessful. Among the more notable failures were: the Ritchie-MacLaren brothers' venture; the Nickel Steel Company of Canada; F.H. Clergue, the Boston promoter who formed the Consolidated Lake Superior Corporation at Sault Ste. Marie (capital \$117,000,000); the Dominion Nickel-Copper Company, headed by J.R. Booth and M.J. O'Brien; and the British American Nickel Corporation, formed by a syndicate lead by a New York financier, Dr. H.F. Pearson, and that dynamic duo of
 207
 William MacKenzie and Donald Mann.

Of these "failures", the British American Nickel Co. came nearest to achieving success. The company not only purchased the properties of the Dominion Nickel-Copper Company, but also purchased the North American rights for the Hybinette process for refining nickel electrolytically. While the rights to this process gave British North American a cost

advantage over International Nickel, they were unable to obtain markets and adequate financing because of the dominance of International Nickel, 208 backed-up by Morgan, in these critical areas. The company managed to survive until 1924, in part a result of government intervention in nickel production because of the First World War, and aggressive sales practices on the part of the company in the United States--an event leading to an inevitable price war with International Nickel, and, in turn, British American's collapse. International Nickel picked up the remains for \$5,000,000 through a dummy-corporation, Anglo-Canadian Mining Company, which put up \$4,000,000 of British American bonds as security. As a result, International Nickel ended up with the North American rights to the Hybinette process, which, along with the Orford process, gave the company 209 a virtual monopoly over refining.

The only company to survive in the Sudbury district, besides the International Nickel Co., was the Mond Nickel Company, a British company set up by Ludwig Mond, to supply his refinery in Wales. The process developed by Mond had been optioned by Canadian Copper in 1889, and then it was let go because of Mond's \$2,000,000 price tag on his patent. Mond, unable to sell the patent, purchased a number of mines in the Sudbury area: initially the Victoria and Garson Mines, building a smelter at the Victoria 210 Mine in 1902, and a refinery at Clydach, Wales, in 1902. Later, the Frood Extension, Worthington, Blezard, and Kirkwood were added. In 1913 Mond purchased the Levack Mine for \$750,000, and built a new smelter at 211 Coniston. Mond continued to operate successfully until its merger with International Nickel in 1928; this was a merger of convenience for both parties concerned, since it allowed for the exploitation of the massive

Frood orebody which the companies shared. With the merger, International Nickel obtained the rights to the Mond process, and, in turn, held monopoly²¹² rights over all nickel refining processes in North America and Britain.

In the development of the Sudbury mines, miners were originally employed under systems of contract.

We employ 32 miners at the Copper-Cliff and 12 at the Evans; we work night and day and the shift is ten hours. We have not had any difficulty in getting a supply of skilled labor. We pay outside men \$1.40, miners about \$1.75, and machinists \$2. The shafts and drifts are sunk by contract. Some of those working by contract make as high as \$2.75 and \$3.00 per day.²¹³

Such a system was gradually replaced by time work, as minimum day rates were set for contract work, exemplified by the following rates paid by Mond Nickel Co. (Garson Mine) in 1912 for a ten-hour day: rock house,²¹⁴ \$1.75; mucker, \$2.10; machineman helper, \$2.25. These are daily rates. In 1917 this wage system was generally in force as hourly wages were being paid, varying from 25 cents an hour for surface labourers to a high of 50 cents an hour for some tradesmen. A bonus was paid for production above a specified minimum. At this time the eight-hour day law was in effect for underground workers in Ontario. The statute did not, however, cover surface workers, who still worked shifts varying from eight to ten hours per day. There was developing, as well, by 1917 a rather extensive hierarchy within the mines, as fifteen job categories were referred to by²¹⁵ the Royal Ontario Nickel Commission.

While the system of work in the Sudbury Mines gradually changed, such changes were somewhat uneven, leading, at times, to differences between the miners and the mining companies, such as the 1913 dispute between the Mond Nickel Co., and its Garson employees. This dispute, which

resulted in a strike lasting two days, was over the following grievances:

(1) an eight-hour day, (2) wage parity with International Nickel miners at Creighton--mucker, \$2.25/day; machineman helper, \$2.50/day; and, machine-man, \$3.00/day, (3) the company to replace any tools broken (rather than the workmen having to replace them), (4) the company to supply the oil for the machines (drills), (5) the installation of a man-hoist, and (6) payment in cash rather than by cheque (which necessitated a trip to Sudbury in order to cash it). Although the men obtained their demands, there appeared other underlying problems such as social differences between the workers (predominantly Eastern European and Finnish), and the bosses (predominantly English).
216

While the Sudbury district was becoming dominated by the International Nickel Company, there were events occurring in mining in other districts of North-Eastern Ontario, starting with Cobalt, which was revealing a somewhat new trend in Canadian mining--the growth of entrepreneurial capitalists within mining, some of whom were Canadian, and, coincidentally, a process of accumulation of capital within mining.

The beginning of mining in North-Eastern Ontario occurred with the discovery of silver in 1903, at mile 104 of the Temiskaming and Northern Ontario Railway, later named Cobalt.
217
There resulted a rush of prospectors and speculators to the region; facilitated immeasurably by the fact that the speculators could make the journey from Bay Street and other similar financial districts by Pullman car. Among those who had entered the district were two brothers from Mattawa, Ontario--Noah and Henry Timmins--who purchased the interests of Fred Larose, a partner in the original discovery.
218
Starting with the Larose Mine, the Timmins family

continued on to build up a mining empire including interests in Hollinger
219
Consolidated, Noranda Mines, and later, Iron Ore Company of Canada.

Besides attracting small-time operators like the Timmins brothers,
the Cobalt boom also attracted capital from outside of Canada, in particular,
220
American capital. Bay Street interests also entered the region, however,
such as Henry Pellatt, J.P. Bickell, the stock-broker, as well as capital-
ists such as J.R. Booth and M.J. O'Brien, both of whom had extensive lumber
221
interests.

The development of the Cobalt mines led to further mineral rushes
to the north and west, resulting in further discoveries of silver at Elk
222
Lake in 1907 and at Gowganda in 1908. Even more important, however,
was the northward penetration of prospectors which led to the gold dis-
coveries of Kirkland Lake and the Porcupine district, as well as the copper-
gold discoveries of Rouyn-Noranda. Just as with the Cobalt district, these
discoveries attracted the attention of speculators and other potential in-
vestors in mines. In time the three original discoveries in the Porcupine
fell into the hands of such capitalists, becoming, in turn, the Hollinger
Consolidated Gold Mines Ltd., McIntyre Porcupine Mines Ltd., and Dome Mines
Limited. The Hollinger Consolidated, incorporated in 1911, was a product
of the Timmins-McMartin-Dunlop syndicate which owned the LaRose Mine in
Cobalt; this syndicate having purchased claims staked by Benny Hollinger
223
and Alex Gillies. Similarly, McIntyre Porcupine Mines was formed in
1911 to work the claims staked by Sandy McIntyre, with surrounding claims
being purchased by the company. Originally formed by American capitalists
and controlled from New York, in 1914 the company passed into the hands
224
of a Toronto syndicate headed by J.P. Bickell, the stock-broker. Dome

Mines Limited, unlike the previous two companies, was formed and controlled by New York capitalists. The company, incorporated in 1911 as the Dome Mines Company Limited, was formed to work claims staked by John S. Wilson and company--a group including Harry Preston--which were grubstaked by W.S. Edwards and Dr. T.N. Edwards of Chicago. Edwards became the first president of the company, the shareholders of which included Ambrose Monell and Joseph R. Delamar of New York, both of whom were officers of International
225
Nickel Co., Ltd.

The above companies became the major producers of the Porcupine district; however, other significant producing mines were developed in the region, including West Dome Mines Limited, headed by Henry S. Pellatt as
226
President and F. Augustus Heinze (of Kootenay fame) as managing director. Also of significance were Pamour Porcupine Mines Limited, incorporated in 1934 with the merger of a number of adjoining small mining properties, and Aunor Gold Mines Limited, both of which were taken over by Noranda Mines
227
Limited.

Parallelling the discovery of gold in the Porcupine region was the opening of the Kirkland Lake gold fields, where six mines were producing, or being developed, by 1920. Of these, two were particularly successful--Lake Shore Mines Limited, which produced by 1955 nearly \$250,000,000 in gold, while paying over \$100,000,000 in dividends; and Wright-Hargreaves Mines Limited, which produced over \$136,000,000 in gold and paid over
228
\$50,000,000 in dividends by 1955.

The mining boom of North-Eastern Ontario, unlike previous mining adventures in Northern Ontario, fed further expansion as capital accumulated because of the production of silver and gold at Cobalt and the Porcupine-Kirkland Lake districts respectively.

The extraordinary wealth of the Cobalt field provided a base for independent financial growth in Canadian mining and the increasing strength of large mines in development of mining has weakened the position of American and British capital. 'Canadian capital exceeds that from all external sources combined by a liberal margin'.²²⁹

The development of Noranda Mines Limited is possibly the best example of such expansion, based on the ploughing-back of accumulated capital into mining. In order to finance the construction of a thousand-ton-a-day smelter and develop the Horne Copper Mine, Noranda entered into an agreement with Hollinger Consolidated Mines Ltd., resulting in Hollinger advancing the sum of \$3,000,000 to Noranda in order to bring the works into production. This loan was secured with bonds of ten-year duration, with Hollinger as well receiving a bonus of 30,000 shares in Noranda stock.²³⁰

During the period between 1890 and 1920, mining in Canada not only continued to display an increasing dominance of the capitalist mode of production, but also revealed that transitions were occurring within the capitalist mode as it related to mining. Within mining, there was occurring tendencies leaning toward consolidation and monopolization, as was evidenced by the integration of mining and smelting operations, and an accumulation of capital generally within mining as companies invested profits on existing mines into the acquisition and development of new mines. Such tendencies were associated with the development of finance capital within the capitalist mode of production. With the increased tendency toward consolidation and monopolization there occurred changes at the level of the relations of production and productive forces; both within the capitalist mode, and in regard to the decline of the petty commodity mode of production associated with mining.

While mining in Canada underwent a tremendous expansion during this period, the entrance of finance capital into mining facilitated the application of higher forms of technology at an unprecedented level, with mining and smelting becoming integrated operations involving the rational planning of production. In the development of mining after 1890 there was an increase in the size of productive units and the labour force in mining. This expanding labour force, however, was still heavily dependent on immigration. At the beginning of the period (1890), the majority of the work force appeared to be drawn from Britain to work the mines in such areas as Sudbury.

It is difficult to get miners and laborers on account of the isolated position occupied by the mines. The men employed are largely Cornish and Welsh, and they are paid monthly in cash.²³¹

After the turn of the century, immigrants continued to comprise the majority of the labour force, as is illustrated in Table I. Donald Avery has also revealed that immigrant labour served as an important source of cheap industrial labour as much as this involved agricultural settlement.²³² Prior to the World War I, industrialists, including the mining industry, had a major interest in immigration policy as it related to an adequate supply of labour.

There were similar trends in the mining industry in the economic utilization of the foreign worker. From the entrepreneurial perspective the greatest advantages to be derived from importing large numbers of continental Europeans for mining work was that they were prepared to work for wages and in conditions that would not be tolerated by either native Canadians or by British workers. As one mining authority put it: 'Canadians won't work in the mines. They are quite willing to boss the job but they are not going to do the rough work themselves What we want is brawn and muscle, and we get it'.²³³

While immigrant labour continued to comprise a majority of the mining work force, a shift occurred in relation to the source of such workers. In the

Table I
Percentage of Workers in Selected Industries
of Canadian and Immigrant Origin
1911-1931

INDUSTRY*	1911 C-B*	IMM.**	1921 C-B	IMM.	1931 C-B	IMM.
Agriculture	68.1	31.9	70.5	29.5	70.1	29.9
	(72.7)	(27.3)	(70.4)	(29.6)	(70.1)	(29.9)
Forestry***	73.2	26.8	76.2	23.8	76.9	23.1
	-	-	-	-	-	-
Mining***	47.7	52.3	47.6	52.4	48.2	51.8
	-	-	-	-	-	-
Manufacturing	68.2	31.8	64.1	35.9	63.1	36.9
	(64.6)	(34.5)	(61.7)	(38.3)	(60.2)	(39.8)
Transportation	54.9	45.1	62.8	37.1	64.9	35.1
	(54.7)	(45.3)	(62.1)	(37.9)	(63.8)	(36.2)
<u>Total</u>	68.1	31.9	66.9	33.1	67.0	33.0
	(66.8)	(33.2)	(65.7)	(34.3)	(65.3)	(34.7)

Sources: Census of Canada, 1911, 1921, 1931

*Figures in brackets represent male work force in all industries.

**C-B refers to Canadian-born

IMM. refers to immigrant

***For the years 1911-1931, figures in mining and forestry represent male only, as female workers made up <0.50%.

period after 1900 British miners were becoming a less important source of labour. By 1917 the Royal Ontario Nickel Commission found that in the Sudbury mines no more than twenty-five percent of the labour force was of Canadian or American origin, with Canadians and Americans being, more often than not, tradesmen. Conversely, among underground workers, drill runners and helpers were principally Finns and Austrians, while trammers were principally Poles, Italians, Austrians, and Russians.²³⁴ Innis noted, similarly, that in the Cobalt district immigrant workers from Eastern Europe and the Western United States replaced trained miners from Nova Scotia during a strike in 1907.²³⁵ Likewise, in the Porcupine and Kirkland Lake districts, the labour force in the mines was becoming cosmopolitan.

The mine workers are a most cosmopolitan population. For common labour and shovellers, Italians and Russians are mostly employed; underground drilling is mostly done by Finlanders, Swedes, and Austrian Poles. Canadians, English, Irish, and Scotch are employed as mechanics, woodworkers in the mills, and for other surface operations, while the engineer's staff are practically all Canadian.²³⁶

While immigrants were an important source of labour in mining, the involvement of immigrant labour varied on a regional basis within Canada, as Table II illustrates. In British Columbia and the Prairie Provinces immigrants virtually comprised the whole mining labour force, where in many regions Canadian miners were few and far between, as noted in the Report of the Commission Relating to Unrest and Discontent Among Miners and Mine-Owners in the Province of British Columbia, in regard to the Kootenays. In this region, it was reported, the majority of the miners were from the United States, while a fewer number were from Nova Scotia, Lake-of-the-Woods, Europe and Australia.²³⁷ Immigration also served as the major source of labour in the mines of Ontario, although not to as great an

extent as in Western Canada. As earlier noted, the majority of the im-
 238
 migrants were from Eastern and Northern Europe.

Table II
 Percentage of Workers of Immigrant Origin
 in the Mining Industry (by regions)
 1911-1931*

REGION	1911	1921	1931
Atlantic Provinces	27.2	28.1	26.4
Quebec	15.1	11.1	25.3
Ontario	48.6	48.2	56.2
Prairie Provinces	85.6	84.7	80.7
British Columbia	84.4	80.0	78.1
Canada	52.3	52.7	54.1

Sources: Census of Canada, 1911, 1921, 1931

*The figures represent male workers, since female involvement in the mining industry was under the 0.5% level of the total mining work force.

While immigration continued to serve as a source of labour, in the period between 1890 and 1920, certain changes took place. Whereas at the beginning of the period immigration was the major source of skilled miners, by 1911 immigrants tended to be over-represented in labouring and relatively unskilled jobs, as is illustrated by Table III. Innis notes a similar trend in the Cobalt and Porcupine-Kirkland Lake districts, although in 1922 Cornish miners were still being recruited for the Porcupine gold mines
 239
 because of a shortage of skilled miners.

While an expansion of the total labour force in mining took place, similarly, with a few exceptions, such as in some of the Kootenay mines,

there was a general increase in the size of the labour forces in individual mines. In the Kootenays, mines employing as few as four men were operating near Slocan. Such operations involved generally small, high-grade deposits of ore.

Table III
Percentage of Mine Workers
in Selected Occupational Categories of Immigrant Origin
1911-1931

OCCUPATIONS	1911	1921	1931
Operators and Officials	44.1	46.7	-
Owners and Operators	-	-	44.4
Foremen and Overseers	-	-	47.7
Drillers and Borers	39.2	38.9	-
Operatives	55.1	56.6	-
Miners	-	-	38.1
Haulage Workers	-	-	40.1
Labourers	56.4	48.6	52.6
<u>Mining Total</u>	52.3	52.6	54.1

Sources: Census of Canada, 1911, 1921, 1931

In contrast to such small mines, the four mines at Rossland had a combined labour force of approximately 500 men in 1895-1896, and 820 by 1908, while another mine in the Slocan district employed 130 . . .
 240
 (miners, labourers, etc.). Not only was the size of labour forces expanding, but within the work place there was developing an expanding hierarchical structure. There was an increasing division of labour and/or tasks, as is illustrated in Table IV.

Table IV
 Scale of Wages Paid
 for Ordinary Mine Labour
 Sudbury, 1917

MINE LABOUR	CENTS PER HOUR
Drill runners	40 1/2 - 47
Drill helpers	34 1/2 - 40 1/2
Trammers	25-31
Timbermen	40-47
Scalers	34 1/2 - 47
Pumpmen	40 1/2
Hoistmen	37 1/2 - 50
Chute blasters	37 1/2 - 44
Cage tenders	34 1/2 - 37 1/2
Surface labourers	25
Rock pickers	25
Machinists	31 1/2 - 50
Blacksmiths	37 1/2 - 50
Carpenters	40 1/2 - 50
Electricians	40 1/2 - 50

Source: The Report of the Royal Ontario Nickel Commission, Toronto (1917), p. 225.

Also, as was discussed in the previous section, within coal mining, a similar division of labour and tasks had developed. This is illustrated
 241
 in Table V. As Tables IV and V show, labour within the mining industry

was being broken down into tasks, and, correspondingly, a rather extensive
²⁴²
 hierarchical structure was beginning to form within the mines.

The development of such a division of labour toward division by tasks was, in turn, influenced by the increased application of technology and the development of finance capital associated with the process of consolidation and monopolization in mining. In the application of higher forms of technology, there developed both an increased utilization of machinery and the modification and/or development of new mining methods.

By the turn of the century, hand drilling had been virtually replaced by steam, and, more often, pneumatic drills (piston and hammer drills), while the capacity of air-compressors supplying air to the pneumatic drills was increasing. Such a change, as illustrated earlier, increased the production by eight- to tenfold or more over hand drilling; with drilling progress in some cases increasing from four inches to four
²⁴³
 feet per shift. In time, the trend led to lighter and more efficient drills.

In 1906 the use of heavy reciprocating or piston drills was general Gradually the demand for the use of power drills in underground mining led to the reduction in size and weight of the piston drills and the trend began to be away from steam towards the universal use of compressed air. By 1914, however, the introduction of hollow drill steel and water jets as well as the improvement and modification of the drill itself had enabled the hammer drill to drill as deep holes as the piston drill. This led to the gradual displacement of piston drills owing to the lightness, greater mobility, and faster cutting speed of the hammer drill. Piston drills are now obsolete, and the hammer drill has been so much improved by the refinement of valve and piston action and the use of alloy steels that it now weighs less than half what the early models did and can drill twice as fast.²⁴⁴

Table V

Scale of Wage Rates per Diem
of the Western Fuel Company
Nanaimo, British Columbia, 1911

OCCUPATION DOLLARS PER DIEM

Fire Boss	\$3.25
Shotlighters	3.00
Bratticemen	2.60
Timbermen	3.00
Timbermen helpers	2.60
Tracklayers	2.75
Tracklayer helpers	2.60
Roadmen	2.60
Drivers, boss	3.00
Drivers, double	2.75
Drivers, single	2.60
Drivers, boys	1.50 - 2.25
Pushers	2.60
Linemen	3.00
Motormen	2.75
Motormen, assistants	1.50 - 2.25
Engineers, diagonal slope	2.75
Engineers, endless rope	2.25
Winches	1.00 - 2.60
Rope inspector	3.00
Endless ropes, men	2.60 - 2.75
Endless ropes, boys	1.25 - 1.75
Rope riders	1.50 - 2.60
Door boys	1.00
Cagers	3.00
Cagers, assistants	2.60
Miners	3.00
Loaders	2.60
Machine runners	3.00, 3.25, 3.50
Machine helpers	2.60
Drillers	3.00, 3.25, 3.50
Brushers	2.75
Muckers	2.60
Cogmen	2.60
Labourers	2.60
Pipemen	2.60 and 3.00
Pumpmen	2.60
Stablemen	2.60

Source: The Report of Royal Commissioner on Coal Mining Disputes on Vancouver Island, Ottawa (1913), pp. 31-32.

Similarly, new methods and new machinery were developed in regard to the haulage of ores. As mines penetrated to greater depths, hoists were developed with increased lifting capacity. The movement of muck (ore) to the shafts involved the replacement of horse-drawn cars to electrically powered trams (either with overhead lines or storage batteries). However, just as important was the change in methods associated with haulage, which permitted the handling of larger tonnages of muck. Rather than loading muck at all level stations, a system of ore passes connected all levels to one or two loading pockets in the shaft.

This was augmented by the installation of crushers above the loading pocket to increase the skip-load by reducing the voids, and incidentally, to eliminate the hoisting delay caused by large-pieces and the installation of measuring pockets, in order to have an exact skip load ready to load into the skip.²⁴⁵

Likewise, changes occurred in the actual mining as it became possible to mine low-grade ore bodies. The introduction of new methods of mining, similarly, such as cut-and-fill, square-set and at shallower depths shrink-²⁴⁶ age stopes, made possible the large-scale working of low-grade ore deposits.

With the development of more sophisticated technology there was a corresponding decline in mining as a skilled occupation, associated with the division of labour by tasks. Miners were no longer required to be familiar with all aspects of mining. Rather, there were developing technical specialists associated with the management of mines, either as owners or as agents. The development of such specialists not only occurred with respect to the day-to-day operations of mines, but also with the exploration of new minerals.

While the capitalist mode of production continued to expand and develop in the period after 1890, there was a corresponding decline of

the petty commodity mode of production so that by 1920 the petty commodity producer was all but a thing of the past. Although the petty producers were prominent in the early development of the Klondike placer deposits, with the development of hillside and bench claims and the corresponding introduction of hydraulic and dredging methods, the petty producer was increasingly supplanted by the capitalist mode of production. Similarly, in lode mining, the position of the petty producer declined even further.

With the decline of the petty commodity mode in mining the position of the petty producer tended more toward the prospector (grubstaker). This relationship (grubstaking) was involved in a number of important mineral discoveries in Canada, particularly the gold and copper discoveries of the Porcupine, Kirkland Lake, and Rouyon-Noranda districts of North-Eastern Ontario and North-Western Quebec.

The prospector discovering the ore was probably supported by a stake provided by a small group. This small group would proceed to dispose of its ownership on the best possible terms to a wide variety of interests. The search of large mining organizations with declining reserves for new properties created a demand for options in which properties were taken up for a definite period of time. With large capital resources work was prosecuted and action taken as the results warranted. In the vast majority of cases the options were dropped by these organizations chiefly because the prospects were not promising and partly because of the conservative attitude of large mining organizations.²⁴⁷

The character of this relationship reflected the relative weakness and dependence of the petty producer on the capitalist mode. The grubstaker/pro prospector and associates generally lacked the financial resources required to develop, and in many cases fully explore their mineral discoveries, requiring the optioning of such property to capitalists associated with large mining corporations. In time, the prospectors would give way to the specialists (geologists) since, correspondingly, there developed

new methods and equipment which not only facilitated the location of new deposits, but also determined the extent and content of ore-bodies with the minimum of risk. The simple methods of searching used by the prospector would, in time, be replaced by geophysical prospecting, "involving
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the use of electric, magnetic, gravity, and seismic instruments".

One final aspect of mining in the period between 1890 and 1920 was the continued involvement of foreign capital to a substantial degree. The Royal Commission on the Mineral Resources of Ontario, in 1890, came "to the conclusion that more than one-half of the capital invested in mining operations in Ontario is American, and that the amount of Canadian capital
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invested exceeds the amount of English capital". Similarly, in the Kootenays, American capitalists were initially involved to a substantial
250
degree. While American and Canadian capitalists became more and more involved in mining in the period after 1890, British capitalist involvement
251
initially increased, then it declined after 1900. This change in British involvement was, in part, related to the nature of British involvement, which tended to differ from American and Canadian involvement. Unlike the North American capitalists, the British capitalists tended to purchase
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"their mineral claims from Canadian or American companies or individuals".

The Canadian experience prior to 1914 suggests that British investors attempted to avoid the impact of the riskiness associated with mining exploration and development. By buying existing mineral claims and developed properties or mines an attempt was made to minimize this risk. Original prospecting and early development of mineral claims was carried out not only by Canadians but by American direct investors. The British companies refrained. Few British companies engaged in exploration.
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Although such involvement should have reduced any risk to British capital, much of its involvement was strictly speculative--the buying and selling

of mining claims at inflated prices. Further, the British companies which were actively mining tended to be unfamiliar with local geological conditions and tended also to build excessively large plants.

In the period between 1890 and 1920 the capitalist mode of production continued to develop and dominate within mining, while the petty commodity mode by 1920 had all but disappeared. Within the capitalist mode, at the same time, transitions were taking place. Mining was increasingly being penetrated by finance capital, and with it a process of consolidation and monopolization was occurring.

Summary

Discussion in this chapter has concentrated on the nature of the process of transition from the petty commodity mode to the capitalist mode of production within mining, serving as an illustration of the transition to and development of the capitalist mode within Canada. Such an examination proceeded in a descriptive way, dealing with the process on two levels: (1) the interplay between the social relations of production and the productive forces as this relates to the process of transition between modes of production, and (2) the conditioning of this process of transition through the increasing expansion of the capitalist mode of production on a world scale. In examining the interplay between relations of production and productive forces as this related to the process of transition within mining, discussion emphasized the increasing subordination of the producers to non-producers and the work process, occurring nearly simultaneously with the expanded application of more advanced technology. This interplay, it was further illustrated, was conditioned by the expansion of capital on a world scale, since the development of mining not only involved "foreign"

(non-Canadian) capitalists, but also drew upon "foreign" sources for substantial amounts of technology and labour (through immigration). The examination of this process within mining was discussed in terms of three periods: (1) the pre-Industrial Revolution period (prior to 1840-1845), (2) the period of Industrial Revolution within Canada (1845-1890), and (3) the period of developing monopoly capital within mining (1890-1920). The discussion of the development of mining in terms of the three periods outlined was undertaken in order to highlight new or predominant forces upon mining, and development in general. In each period capital was expanding in a specific form or direction, both within Canada and on an international level. Within mining, this expansion of capital was both conditioning and conditioned by the conflicting social relations of production, and the interplay of such productive relations with the changing forces of production.

The development of mining prior to 1840 occurred during an era in which mercantilism was the dominant, although declining, force--both internally (within Canada) and within the colonial system of Britain. Under the French regime, the feudal-absolutist state served to further frustrate the development of the capitalist mode of production, both within mining, as well as in other activities. In this period of mercantile dominance mining in Canada, which strictly involved coal and iron production, reflected this dominance. Under both the French and British regimes, it was illustrated that coal mining was a very primitive operation, generally undertaken intermittently to meet local needs (i.e., to supply the Louisbourg garrison), or for illicit trade with New England, although the coal lands were leased through royal charters at various times. Such

operations of the French involved essentially grubbing operations: picking the coal out from outcrops with iron bars and shovels. In view of its primitive operations, in terms of technology and labour process, and the relative lack or at least inability of feudal-absolutist control, coal mining under the French regime appears as the activity of petty producers.

Under British control, coal mining initially resembled the operations of the French as the coal lands were let out by a system of long-term leases, giving the holder a monopoly over coal production. Although a system of contract labour developed, illicit trade also continued. During this period, however, the first major fundamental change occurred in coal mining with the leasing of the Cape Breton coal mines to the General Mining Association in 1826. The provisions of the lease provided the Association with a virtual monopoly over coal and mineral production, and, therefore, varied little from the mercantilist character of the previous arrangements. While the Association retained a character reflecting mercantilist dominance, it also represented an advance upon previous operations for coal mining ceased being a haphazard venture, but involved the application of relatively advanced technology. Even with this change, however, the organization of the work force retained its previous form of contract labour.

Unlike the coal mining operations, the Forges of St. Maurice developed into fairly extensive operations, involving the application of relatively advanced technology and a work process of a manufactory nature. The Forges, however, were also dominated by feudal-absolutist and mercantilist interests dominant within the French colonial system. It was a state chartered operation with the charter holder having certain monopoly rights, while

also having certain restraints placed upon it by a colonial system which discouraged the development of industries within the colonies.

The development and operation of iron mines and works during the period of British colonial administration, similarly, were of a manufactory nature, although ownership of the St. Maurice Forges passed into the hands of English-Canadian interests. Toward the end of this period, iron works were being developed in Upper Canada and Nova Scotia. These works were essentially similar to the Forges in their manufactory nature, and relatively primitive in comparison to developments in Britain and the United States.

Mining, therefore, during this period reflected the dominance of the declining mercantilist interests associated with firstly the French and later the British colonial systems. Toward the end of the period, however, forces of changes were becoming evident with the assault in the Nova Scotia legislature upon the lease of the General Mining Association, while in the Canadas various attempts were made in the legislature to facilitate the exploitation of mineral resources through the launching of a geological survey.

The period between 1845 and 1890 was viewed as the period of the Industrial Revolution within Canada. At the beginning of this period, it was argued, two events of historical significance took place, linked to forces of change associated with the Industrial Revolution in Britain. Within Britain there had taken place a "passage" of dominance from mercantilist and great landowner interests to the new industrial bourgeoisie, such that by the 1840s the industrial bourgeoisie was dominant. This, in turn, had an influence on the British colonial system and ruling groups within the colonies. In British North America forces of change were

arising to challenge the existing alliances of the colonial system. Such forces were linked to an emerging industrial bourgeoisie. During this period, mining, as well as other sectors, underwent a transformation with the capitalist mode of production becoming dominant while the petty commodity mode declined. This process of transition involved changes at the level of the relations of production and productive forces. The changes, however, were influenced not only by internal forces, but by forces associated with the expansion of the capitalist mode of production on an international scale.

In the process of transition to a capitalist mode of production within mining in Canada, it was illustrated that a number of changes occurred. At the level of the relations of production, labour was engaged under various forms of wage contract, varying from modified forms of tribute and tutwork to various forms of contract based on weight, length, area, and volume, to time work (daily or hourly wages). It was further illustrated that in this period contract work (piece work) was predominant, although declining toward the end of this period, and being replaced by time work. Simultaneously, within the work place, it was pointed out that fairly extensive social hierarchies or divisions of labour were developing. On the level of the productive forces associated with mining in terms of the capital mode of production changes were also occurring during this period. Initially, productive units were generally quite small, employing labour forces of seldom more than fifty men, and with twenty-five to forty men more common. The technology employed was initially rather primitive in comparison to developments which would occur as this period progressed. Toward the end of the period, it was illustrated, simultaneously

with the expansion of the labour force, there was an increased introduction of improved methods and machinery in the mines. While such changes occurred in the social hierarchies of the work place and in the technology being applied, the nature of involvement of capital was also changing. It was pointed out that in the early part of the period between 1845 and 1890 the capitalist mode was characterized by a general pattern of non-accumulation within mining. As the end of the period drew near, this pattern was being replaced by a pattern of accumulation, tending toward monopolization and consolidation within mining.

While an expansion of the capitalist mode of production within mining occurred between 1845 and 1890 in Canada, there also occurred an expansion, then an initial decline of the petty commodity mode of production in mining. The involvement of petty producers, it was demonstrated, was principally in placer gold mining although such petty producers also became involved in other mining ventures. Toward the end of the period the petty commodity mode of production within mining was beginning to decline since petty producers could not match the technological innovation and capital reserves of the capitalist mode.

The period between 1890 and 1920 saw a continuation of the trend developing toward the end of the previous period; a continued expansion of the capitalist mode, along with the decline of the petty commodity mode of production within mining. Within the capitalist mode of production there was occurring an increased tendency toward monopolization and consolidation in mining. This trend, it was illustrated, was associated with an increasing integration of mining and smelting operations and a tendency toward investing profits on existing mines in the acquisition and development

of new mines. Further, this process or trend toward monopolization influenced, and was influenced by, changes continuing to occur in the productive relations and productive forces, both within the capitalist mode of production, and in association with the declining petty commodity mode of production. The tremendous expansion and consolidation was facilitated by the entrance of finance capital into Canada. In conjunction with this consolidating aspect of the process, there was occurring an unprecedented application of higher forms of technology permitting the mining and handling of larger amounts of ore and the engaging of increasingly larger labour forces within the productive units. Just as important, if not moreso, however, was the interaction between technology and relations of production (the hierarchical division of labour within the work place). With the development and application of increasingly sophisticated technology in mining there was a corresponding change in the occupational structure with a division of labour by occupation beginning to be replaced by a division of labour by tasks. Such a development had a tremendous impact on the formation of a labour force as mining was becoming less a skilled occupation while technical specialists were becoming associated with the management of mines.

With the process of monopolization and consolidation associated with the capitalist mode of production within mining, there was, correspondingly, a decline in the petty commodity mode of production in this period, particularly after the Klondike gold rush. The capital outlay necessary in order to undertake a mining venture, increasingly, was out of reach of the petty producer. In time, such producers became more and more dependent on the capitalist mode, so that with the decline of the

petty commodity mode the position of the petty producer tended toward that of the grubstaker/pro prospector, and in time would be replaced by the technical expert (geologist) as the capitalist mode established its hegemony over all facets of mining, including exploration work.

Throughout the periods outlined, it was illustrated that a process of transition toward the capitalist mode of production was occurring within mining in Canada. It was also argued, however, that this process was influenced by forces both internal and external to Canada. The expansion of mining, and the Industrial Revolution in general within Canada, was conditioned by the increasing expansion of the capitalist mode of production on a world scale.

For mining within Canada, this process of transition was conditioned by such expansion in various ways. It was pointed out that the early development of mining, particularly as it developed in the periods before 1890, was dependent heavily on technology, capital and labour from sources outside Canada. Immigration, it was noted, provided for the lion's share of the work force. Further, such immigration was influenced by the level of technological development, particularly as it related to the requirements of skills. While mining remained a skilled occupation, immigration followed a pattern of drawing workers from established mining regions, such as Cornwall, the Welsh coalfields, Scottish coalfields, and lesser so, the German mining regions (Harz Mountains). The development of improved machinery and methods influenced the requirements for skilled labour, and, in time, was associated with a change in this pattern, as mine labour was drawn from new sources such as the predominantly agriculturally-oriented regions of Eastern Europe. Further, the technology was originally drawn

from European and, later, United States' sources. It was with the development of an industrial sector within Canada that such technology became available and was further developed within Canada, as was evidenced in the agitation of the mining interests against certain tariff aspects of the National Policy, in 1890. Capital, similarly, was influenced by foreign sources. Prior to 1890, it was illustrated, mining involved a substantial amount of American and English capitalists, as well as members of the developing Canadian commercial and industrial bourgeoisie. While such capitalists continued their involvement after 1890, it was further illustrated that during this latter period, a process of accumulation became prominent within Canadian mining. This process was associated with the consolidation and monopolization within mining; a process occurring both within Canada and on an international level, involving both Canadian and non-Canadian capitalists.

NOTES TO CHAPTER IV

1. H.C. Pentland, "The Development of a Capitalist Labour Market in Canada", Canadian Journal of Economics and Political Science. Vol. XXV, No. 4 (November 1959), pp. 454-455.
2. Stanley Ryerson, Unequal Union. (Toronto, 1975), pp. 19-20, 32, 220-243; "Whose Looking after Business?", This Magazine. Vol. X, No. 394 (November-December 1976), pp. 42-46.
3. This is a central issue in the debates discussed in Chapter II, involving R.T. Naylor, Stanley Ryerson, and Simon Rosenblum, over the nature of the capitalist class in Canada. See: Chapter II, Supra, pp. 89-92.
4. H.C. Pentland, "The Role of Capital in Canadian Economic Development before 1875", Canadian Journal of Economics and Political Science. Vol. XVI, No. 4 (November 1950), pp. 457, 468-471.
5. Ryerson, Unequal Union, pp. 253-257, 260-262.
6. Ryerson, Unequal Union, pp. 253-254, 258-260.
7. Ryerson, Unequal Union, pp. 262-267; also, Ryerson, "Whose Looking after Business?", p. 43. Although discussion on the Industrial Revolution in Canada has concentrated on the work of Pentland and Ryerson, numerous other works have dealt with the same period of transition. Among them, a couple of interests should be mentioned. Steven Langdon, in his M.A. thesis, studied the effect of the industrial revolution (or transformation) within manufacturing in Canada, emphasizing not only the increased application of machines "harnessed to non-human and non-animal power", but also the changing relationship between the producers and non-producers, as well as a "re-structuring of the whole political economy".

The second work, a Master's thesis by John Barkans, emphasized the role of railroads in the transition to industrial capitalism by highlighting the development of capitalist productive relations associated with railways. Further, the thesis was intended also as a means of coming-to-grips with the debate over railways as mercantile capital (e.g., Naylor).

See: Steven Langdon, "The Political Economy of Capitalist Transformation: Central Canada from the 1840s to the 1870s", M.A. thesis Carleton University (1972); John Barkans, "Labour, Capital and the State: Canadian Railroads and Emergent Social Relations of Production, 1840-1879", M.A. thesis, McMaster University (1976).

8. Alice Jean Lunn, "Economic Development in New France, 1713-1760", Ph.D. dissertation, McGill University (1942), pp. 280-283.
9. T.A. Rickard, A History of American Mining. (New York, 1932), pp. 222-223.
10. Rickard, Ibid., pp. 149-151.
11. D. Neill, "Sieur de la Ronde, Navigator of Lake Superior", P.A.C. Pamphlet Collection, Ref. No.: 2-1649, pp. 184-198.
12. Richard Brown, The Coal Fields and Coal Trade of the Island of Cape Breton (London, 1871), p. 45.
13. Brown, Ibid., p. 46.
14. Brown, Ibid., pp. 47-48.
15. Brown, Ibid., pp. 49-51.
16. Ryerson, The Founding of Canada/Beginnings to 1815. (Toronto, 1975), pp. 155-156.
17. Ryerson, The Founding of Canada, p. 157.
18. Ryerson, Ibid., pp. 157-159. Also see: Pentland, "The Development of a Capitalist Labour Market in Canada", pp. 454-455.
19. Pentland, "Ibid.", p. 454.
20. D. Neill, "Op. cit.", P.A.C. Pamphlet Collection, Ref. No. 2-1649, p. 190.
21. Brown, Op. cit., pp. 48-49.
22. Pentland, "The Development of a Capitalist Labour Market", p. 455.
23. Ryerson, The Founding of Canada, pp. 159-160.
24. Brown, Op. cit., pp. 51-59.
25. Brown, Ibid., pp. 58-59.
26. Brown, Ibid., p. 60.
27. Brown, Ibid., pp. 60-66.
28. Brown, Ibid., pp. 68-70. Such contract workers, Brown notes, did not stay with the mines for any extended length of time, but, rather, tended to move to other areas, resulting in a rather unskilled labour force.

The workmen were mostly young Irishmen who had been employed in the Newfoundland fisheries. Having earned enough for their purposes, some purchased crown land in Cape Breton, others proceeded to the United States, but very few remained any length of time at the mines. There were, consequently, very few skilled colliers regularly employed at the mines.

Brown, Ibid., p. 69ff.

29. Brown, Ibid., pp. 68-70, 72.
30. Brown, Ibid., pp. 70-71. Also see: Adam Shortt and Arthur M. Doughty, Canada and its Provinces/Volume XIV, The Atlantic Provinces. (Toronto, 1914), pp. 673-675.
31. Brown, Op. cit., pp. 74-75.
32. Brown, Ibid., p. 77.
33. Brown, Ibid., p. 83. Included among the surface installations was "an iron foundry, with fitting shops, lathes, and everything necessary for repairing all kinds of mining machinery, . . . , as there was at that time no place, within a distance of 800 miles where such repairs could be efficiently made".
34. Brown, Ibid., pp. 84-85.
35. W.J.A. Donald, The Canadian Iron and Steel Industry. (Boston and New York, 1915), pp. 44-45.
36. Pentland, "The Development of a Capitalistic Labour Market in Canada", p. 455.
37. Donald, Op. cit., pp. 45-46. Also see: Pentland, "The Development of a Capitalistic Labour Market in Canada", p. 455.
38. Report of the Royal Commission on the Mineral Resources of Ontario and Measures for their Development. (Toronto, 1890), p. 319, 319ff. Hereafter referred to as The Mineral Resources Commission of Ontario. (1890).
39. Donald, Op. cit., pp. 49-50.
40. The Mineral Resources Commission of Ontario. (1890), p. 319.
41. Robert Gourlay, Statistical Account of Upper Canada, Volume I. (1822), p. 325.
42. The Mineral Resources Commission of Ontario. (1890), p. 320.

43. Ibid., p. 321. The date of the founding of the works in the Mineral Resources Commission Report, and in Smith's Canada was stated as 1820. Donald, however, placed the founding of the works at 1830. See: W.H. Smith, Canada: Past, Present and Future, Being a Historical Geographical, Geological and Statistical Account of Canada West, Volume II. (Toronto, 1852), p. 1246. (Reprinted by Mika Publishing, Belleville, Ontario, 1974). This work has quite often been referred to as Smith's Canada; Donald, Op. cit., p. 51.
44. The Mineral Resources Commission of Ontario. (1890), p. 321.
45. Report of A. Manahan and G.A. Ridley, Commissioners on the Removal of the Penetentiary from Kingston to Marmora, 1839; Isaac Buchanan Papers, Volume 115, Ref. No. P.A.C. MG 24 D 16, V. 115. The commission investigated the possibility of transferring 250 prisoners to Marmora at an estimated cost of £9839 6s. 2d. for the construction of a penitentiary wing to house the inmates, and a cost of £ 250 0 0 to transfer them from Kingston; Report of Manahan and Ridley pp. 4-5, 12.
46. Report of Manahan and Ridley, pp. 6-7. McGill, in a letter to the Commissioners, stated that he wished to dispose of all property associated with the works, including all the lands, water lot in Belleville, etc. He offered the property "for the sum of twenty-five thousand pounds, payable in debentures of the Province of Upper Canada, redeemable in thirty years, bearing an interest of five per cent per annum, payable half-yearly".

If, however, the Legislature was "not disposed to buy the whole", he would "consent to sell the works, with all the appurtenances, together with the lands in Marmora and the water lot in Belleville, fuel reserves, and c. for the sum of twenty thousand pounds, payable in debentures of the province, redeemable in thirty years, and bearing an interest of six per cent per annum, payable half-yearly. McGill further indicated that he preferred to dispose of all property, but would consent to keep the timber lands if need be.
Report of Manahan and Ridley, p. 5.
47. W.H. Smith, Canada: Past, Present and Future, Volume II, p. 247.
48. Donald, Op. cit., pp. 55-56.
49. Donald, Ibid., p. 56. Donald sums up the history of the Pictou operations with the following paragraph:

The next early attempt at iron-making in the Maritime Provinces was made in 1827, when the General Mining Association opened its coal mines at Stellarton, Pictou County. One thousand pounds was laid aside for an experiment in iron-making. A foundry and a furnace were built in 1829, and the smelting of several

ores, mostly red hematites, was attempted. The furnace-man in charge was an Irishman experienced in the trade, brought over from Great Britain, but he had great difficulty in getting the metal to flow. Although eight tons of iron were made daily, an excess of phosphorous and lack of silicon made it hard and useless for foundry purposes. After fifty tons had been made, the men got drunk one night and left the furnace to take care of itself, which it did for all time to come. In the morning the furnace was cold and the metal a solid mass.

50. Donald, Ibid., p. 45.
51. Ryerson, The Founding of Canada, pp. 159-164.
52. Ryerson, Unequal Union, pp. 18-20, 39-41.
53. "Origin and Progress of the Geological Survey of Canada" (1851), P.A.C. Pamphlet Collection, Ref. No. 1-2295, p. 3.
54. "Ibid.", P.A.C. Pamphlet Collection, Ref. No. 1-2295, pp. 3-4.
55. Debates of the Legislative Assembly of the Province of Canada, Vol. IV, Part I (1844-1845) (170), 954-955.
56. Brown, Op. cit., pp. 102-105.
57. Journals of the Legislative Assembly of the Province of Canada, Vol. 6 (1847), Appendix AAA.
58. "The Second Report of the Bureau of Mines (1892)/Chapter XVI, The Mining Laws of Ontario", Province of Ontario Sessional Papers (No. 85) (1893), pp. 221-222.
59. Letterbook of the British North American Mining Co., 1846-1910, P.A.C. Ref. No. MG 28 III 22, n.p.
60. Report of Captain John Tregonning on the British North American Mining Co. (1849), P.A.C. Pamphlet Collection, Ref. No. 1-2125, n.p.
61. Letterbook of the British North American Mining Co., 1846-1910, P.A.C. Ref. No. MG 28 III 22, n.p.
62. Statutes of Canada (1847), 10-11 Victoria, Chapters 68-78. A number of prominent individuals were involved with certain of these companies, among them: Sir Francis Hincks, Lake Huron Silver and Copper Mining Co., Echo Lake Mining Co.; David Torrance (President), Canada Mining Co.; Stuart Derbyshire (President), Huron and St. Mary's Copper Co.; Theodore Hart, The Canada Mining Co., Echo Lake Mining Co.; and James Ferrier, British North American Mining Co.

63. Report of the Upper Canada Mining Co. (1847), P.A.C. Pamphlet Collection, Ref. No. 1-2102, n.p.; Report of the Upper Canada Mining Co. (1848), P.A.C. Pamphlet Collection, Ref. No.: 1-2124, n.p.
64. Report of Forrest Sheppard, Esq. On The Lands of the Montreal Mining Co. (1846), P.A.C. Pamphlet Collection, Ref. 1-2052; Journals of the Legislative Assembly of the Province of Canada, Vol. 6 (1847), Appendix AAA; Statutes of Canada (1847), 10-11 Victoria, Chapter 68; Merritt Papers, Vol. 20, P.A.C., Ref. No. MG 24 EI. Among the early shareholders in the Montreal Mining Co. were: Hon Peter McGill, Hon. George Moffat (President), Sir George Simpson, Wm. Collis Meredith, Hon. S.B. Harrison, Wm. H. Merritt, James Ferrier, Stuart Derbyshire (Secretary), Sir Allan Napier McNab, Thomas Cringan, John Hopkirk, John Ewart and Messrs. A. and S. Bagg. James Ferrier was also a shareholder in the British North American Mining Co., while Stuart Derbyshire was the President of the Huron and St. Mary's Copper Mining Co. The Hon. James McGill, Hon. George Moffatt, Sir George Simpson, Wm. H. Merritt, and Thomas Cringan also formed the British American Mining Co. in 1846; British American Mining Co. (1846), P.A.C. Pamphlet Collection, Ref. No. 1-2033.
65. The Mineral Resources Commission of Ontario. (1840), p. 94. (Evidence given by E.B. Borron.)
66. H.J. Carnegie Williams, "The Bruce Mines, Ontario, 1846-1906", The Canadian Mining Journal, Vol. 1, No. 2 (New Series) (April 1907), p. 47.
67. The Mineral Resources Commission of Ontario. (1890), pp. 94-95. (Evidence given by E.B. Borron.)
68. Ibid., p. 95. Also see: Walter William Palmer, "Second Report of the Bureau of Mines (1892)/Chapter XI, A Pioneer's Mining Experience on Lake Superior and Lake Huron", Province of Ontario Sessional Papers (No. 85). (1893), pp. 175-176.
69. The Mineral Resources Commission of Ontario. (1890), p. 101. (Evidence given by William Plummer.)
70. Ibid., p. 101. (Evidence given by Frank Prout.)
71. H.J. Carnegie Williams, Op. cit., p. 49. Williams notes that an attempt was made to re-open the mines in 1898, with the building of a 400-ton/day mill, new pit head gear, shaft house, and dry. A fire destroyed all but the mill, however, and the backers, primarily English capital, preferred to focus their attentions on the goldfields of the Transvaal. In 1905 ". . . a company registered in Ontario, but with English capital", and to which the author was associated undertook to re-open the mines. This company, entitled the Copper Mining and Smelting Co., of Ontario, Ltd., operated the mines from 1906 to 1914. Williams, "Op. cit.", pp. 49-50. Also see: G.A. Cuthbertson, "The

Bruce Mine: A Brief History of Canada's Pioneer Copper Mine", Canadian Mining Journal, Vol. 6, No. 7 (July 1939), pp. 424-426.

72. Robert Bell Papers, Vol. 39, P.A.C. Pamphlet, Ref. No. MG 29 B15.
73. The Mineral Resources Commission of Ontario. (1890), p. 195 (Evidence given by E.B. Borron.) Thomas Keefer has listed twenty-three silver mines which were opened between 1865 and 1883 in the Lake Superior Region. They were as follows:
- 1865-1869
- 1) Enterprise Mine (Black Bay)
 - 2) Thunder Bay Mine
 - 3) Shuniah Mine (later Duncan)
 - 4) Silver Islet (Montreal Mining Co.; later sold to Ontario Mining and Land Co., then transferred to the Silver Islet Mining Co.)
 - 5) Jarvis Island Mine (Montreal Mining Co.; later sold to Ontario Mining and Land Co.)
 - 6) Thompson Island Mine (Montreal Mining Co.; later sold to Ontario Mining and Land Co.)
 - 7) McKellar Island Mine
- 1870-1879
- 8) Silver Harbour (Beck) Mine
 - 9) 3A Mine
 - 10) Cornish Mine
 - 11) McKellar's Point Mine
 - 12) 3B Mine
 - 13) Frowbridge Mine
 - 14) Wollbridge Mine
 - 15) Parreseau Mine
 - 16) Algoma Mine
 - 17) Ecrire Mine (Little Pic River area)
 - 18) Singleton Mine (within Port Arthur city limits)
- 1880-1883
- 19) Rabbit Mountain Mine
 - 20) Rabbit Mountain Junior Mine
 - 21) Silver Creek Mine
 - 22) Twin City (Porcupine) Mine
 - 23) Beaver Mine

The McKellar Brothers (Peter and Donald) were involved with a number of mines in the Thunder Bay area--the Enterprise Mine, Thunder Bay Mine, McKellar Island Mine, McKellar Point Mine, 3B Mine, and Rabbit Mountain Mine. The McKellars were also involved with two gold properties near Shebandowan (west of Thunder Bay), the Jackfish Lake Mine, and the Patridge Lake Mine. Thomas A. Keefer Papers, P.A.C. Pamphlet, Ref. No. MG 29 A9.

74. Ibid., p. 196. (Evidence given by A.J. Cattnach.)
75. Isaac Buchanan Papers, Vol. 4, and Vol. 118. MG 24 D16. Buchanan had fairly extensive interests in mines, both in Canada and in the United States. Among his interests, besides the Thunder Bay Silver Mining Co., were the Superior Silver Mining Co. (1000 shares), Wentworth Gold Mining Co. of Nova Scotia (1000 shares), Eureka Mining Co. (Utah), Cranberry Iron Property (North Carolina), North Star

Silver Mining Co. (Utah, head office in London, Ontario), and New York and Unitah Mining Co. (1/2 of shares); Isaac Buchanan Papers, P.A.C. Pamphlet, Ref. No. MG 24 D16.

76. Ibid., p. 197. (Evidence given by S.J. Dawson.) Also see: Archibald Blue, "Sixth Report of the Bureau of Mines (1896)/Section III, The Story of Silver Islet", Province of Ontario Sessional Papers (No. 33), (1897), p. 158.
77. Ibid., p. 149.
78. Ibid., pp. 142-143.
79. Ibid., pp. 153-154.
80. "Letter from Wm. B. Frue to William Savard, July 30th, 1873", Algoma Silver Mining Co. (established 1868), Silver Islet, Ontario, P.A.C. Pamphlet, Ref. No. MG 29 (III 19), Reel No. C-1336; "Letter from Wm. B. Frue to Thomas Law, March 3, 1872", Algoma Silver Mining Co. (established 1868), Silver Islet, Ontario, P.A.C. Pamphlet, Ref. No. M 28 (III 19), Reel No. C-1336; Archibald Blue, "Sixth Report of the Bureau of Mines (1896)/Section III, The Story of Silver Islet", Province of Ontario Sessional Papers (No. 33) (1897), p. 150ff; The Silver Islet Mine was situated on a small rock, expanded to about ten times its original size into a man-made island on which all the plant offices and boarding houses were situated. This island was about one mile from the mainland at the end of Thunder Cape. On the mainland was situated the townsite, as well as the mill. The miners often spent the work week on the island, particularly due to winter storms, which precluded any communication with the townsite.
81. The Mineral Resources Commission of Ontario . (1890), p. 199 (Evidence given by Thomas Hooper.)
82. Ibid., p. 201. (Evidence given by T.H. Trethewey.) At the Beaver, similar contract rates were paid: "Drifting costs \$4.70 per foot and sinking \$13.50 per foot. The shaft is 8 by 14 feet and the drifts 5 by 7 feet, or the width of the vein. We pay miners \$2 to to \$2.25 and laborers per day \$1.50. The miners work by contract and board themselves; ten hours is a day's work"; Ibid., p. 199. (Evidence given by Thomas Hooper.)
83. Ibid., pp. 170-180.
84. Ibid., pp. 170-171. (Evidence given by George Richardson.)
85. Ibid., p. 172. (Evidence given by James Foxton.)
86. Ibid., p. 177. (Evidence given by Robert C. Adams.)
87. Ibid., p. 170. (Evidence given by Richardson.)

88. Ibid., p. 175. (Evidence given by Robert C. Adams.)
89. Ibid., pp. 176-177. (Evidence given by Robert C. Adams.)
90. Ibid., pp. 130-142. Among the Canadian capitalists interested in the iron mines was Sir Richard Cartwright, President of the Bedford Mining Company. This company, with a paid up capital of \$250,000 was organized in 1889, and held properties in Bedford township, Frontenac county.
91. Ibid., pp. 134-135. (Evidence given by B.W. Folger and Joseph Bawden.)
92. Ibid., pp. 135-136. (Evidence given by B.W. Folger and J.S. Campbell.)
93. J. Douglas, The Goldfields of Canada (1863), P.A.C. Pamphlet Collection, Ref. No. 1-3082. Oatey was employed as a captain by other mining companies in Upper Canada, including the Ramsay Lead Mining and Smelting Co. in 1858, and the Montreal Mining Co. (1849); Report of the Ramsay Lead Mining and Smelting Co. (1863), P.A.C. Pamphlet Collection, Ref. No. 1-3081; Report of Forrest Sheppard, Esq., On the Lands of the Montreal Mining Co., P.A.C. Pamphlet Collection, Ref. No. 1-2052.
94. D.M. LeBourdais, Metals and Men/The Story of Canadian Mining. (Toronto, 1957), pp. 313-314.
95. Statutes of Canada (1863) 26 Victoria; Statutes of Canada, 1864, 27-28 Victoria; Statutes of Canada, 1865, 29 Victoria.
96. James Robb, Mineral Resources of British North America (1863), P.A.C. Pamphlet Collection, Ref. No. 1-3076.
97. LeBourdais, Op. cit., pp. 314-315.
98. L.W. Bailey, Report on the Mines and Minerals of New Brunswick (1864), P.A.C. Pamphlet Collection, Ref. No. 1-3166.
99. LeBourdais, Op. cit., pp. 323-324.
100. Cosmopolite's Statistical Chart of the Gold Mines of Nova Scotia (1862-66), Robert Bell Papers, Vol. 39, P.A.C. Pamphlet Collection, Ref. No. MG 29 B 15.
101. Province of Nova Scotia, Department of Mines, Annual Report on Mines, 1955 (Halifax, 1956), pp. 126-127. While gold mining seems to have ceased in 1947, gold was being produced right up until 1955. This may, in part, be production as a by-product of other metal mines, such as those from the Stirling Mine (a lead-zinc-copper-producer).

102. Guide to the Goldfields of Nova Scotia (1868), P.A.C. Pamphlet Collection, Ref. No. 1-3526.
103. Guide to the Goldfields of Nova Scotia (1868), P.A.C. Pamphlet Collection, Ref. No. 1-3526.
104. Statutes of Canada (1863), 26 Victoria, Chapter XXV; Statutes of Canada (1864), 27-28 Victoria, Chapter CXXI; Report of the Ramsay Lead Mining and Smelting Co. (1863), P.A.C. Pamphlet Collection, Ref. No. 1-3081; Guide to the Goldfields of Nova Scotia (1868), P.A.C. Pamphlet Collection, Ref. No. 1-3526.
105. Report by Mr. B.J. Harrington, Geological Survey of Canada, Report on Progress, 1873-74, p. 258; Donald, Op. cit., p. 225.
106. Iron Mines of Nova Scotia (1857), P.A.C. Pamphlet Collection, Ref. No. 1-2627; Report by Mr. B.J. Harrington, Geological Survey of Canada, Report on Progress, 1873-74, pp. 258-259; Canada Investigates Industrialism/The Royal Commission on the Relations of Labor and Capital, 1889 (abridged) (ed. by Greg Kealey), Toronto 1973), p. 399; Donald, Op. cit., pp. 223-226.
107. Donald, Ibid., pp. 58-59.
108. Donald, Ibid., pp. 59 and 60.
109. Report by Mr. B.J. Harrington, Geological Survey of Canada, Report on Progress, 1873-74, p. 243.
110. Canada Investigates Industrialism/The Royal Commission on the Relations of Labor and Capital, 1889 (abridged) (Edited by Greg Kealey) (Toronto, 1973), pp. 399-401.
111. Brown, Op. cit., pp. 107-108.
112. Paul MacEwan, Miners and Steelworkers. (Toronto, 1976), p. 5.
113. MacEwan, Ibid., p. 5.
114. Report of the Acadia Coal Company (1865), P.A.C. Pamphlet Collection, Ref. No. 1-3293.
115. Report by Charles Robb, C.E., Geological Survey of Canada, Report on Progress, 1872-73, p. 287.
116. Canada Investigates Industrialism/The Royal Commission on the Relations of Labor and Capital (abridged) (Edited by Greg Kealey) (Toronto, 1973), pp. 402-449.
117. Ibid., pp. 402-406.
118. Wm. C. Hazlitt, British Columbia and Vancouver Island (London, 1858), pp. 160-162. The Hudson's Bay Co. was aware of the existence of

coal as early as 1835 when it was brought to the attention of company officials on Vancouver Island by local Indians.

H.H. Bancroft, The Works of H.H. Bancroft/Volume XXXII, History of British Columbia, 1792-1887. (San Francisco, 1887), pp. 186-192.

119. Bancroft, Ibid., pp. 193-196.
120. Bancroft, Ibid., p. 193.
121. Ibid., pp. 195-199.
122. Ibid., p. 199.
123. Ibid., pp. 568-569.
124. Matthew MacFie, Vancouver Island and British Columbia. (London, 1865), p. 145.
125. Bancroft, Op. cit., pp. 568-576.
126. H.H. Bancroft, History of the Pacific States of North America, Vol. 27 quoted in Jack Scott, Sweat and Struggle: Working Class Struggles in Canada, Volume I, 1789-1899. (Vancouver, 1974), p. 182.
127. Gustavus Myers, A History of Canadian Wealth. (Toronto, 1975), p. 309.
128. Scott, Op. cit., pp. 160-162.
129. Report of Royal Commissioner on Coal Mining Disputes on Vancouver Island (1913), pp. 15-17, 29-38.
130. Bancroft, The Works of Hubert Howe Bancroft, pp. 369-370, 573-574.
131. Scott, Op. cit., p. 160.
132. Bancroft, The Works of Hubert Howe Bancroft, pp. 157-158.
133. Bancroft, Ibid., p. 574ff; Royal Commissioner on Coal Mining Disputes on Vancouver Island, pp. 5-6. By 1913 in some mines up to forty occupational categories were recognized by employers, as evidenced in the contracts between the coal mine owners and the employees, presented as evidence before the above commission. Report of Royal Commissioner on Coal Mining Disputes, pp. 29-38
134. Scott, Op. cit., p. 175.
135. Bancroft, The Works of Hubert Howe Bancroft, pp. 341-353.
136. W.P. Morrell, The Gold Rushes. (Chester Springs, Penn., 1968), pp. 129-135.

137. MacFie, Op. cit., pp. 266-276.
138. MacFie, Ibid., pp. 268-269.
139. MacFie, Ibid., pp. 269-270, 272-273; Bancroft, The Works of Hubert Howe Bancroft, pp. 443-444, 461-466.
140. MacFie, Op. cit., pp. 270-276.
141. MacFie, Ibid., pp. 270-272.
142. MacFie, Ibid., p. 274.
143. Table on Gold Production in British Columbia (1858-1875), Robert Bell Papers, Vol. 39, P.A.C., Ref. No. MG 29 B 15.
144. Morrell, Op. cit., pp. 133-135.
145. The Mineral Resources Commission of Ontario. (1890), p. 232 (Evidence given by S.J. Dawson.)
146. Ibid., p. 232. (Evidence given by Thomas Hooper.)
147. Ibid., p. 232. (Evidence given by T.H. Trethewey.)
148. House of Commons (U.K.), Sessional Papers, Select Committee on the Stannaries Act (1869) Amendment Bill, Question 510. (Evidence given by Captain Wm. Rich, mine agent.); Accounts, Parliamentary Papers (U.K.) (1873), Vol. LXI, p. 37 (return of miners and quarrymen who left, 1861-1872); Parliamentary Papers (U.K.) (1868-1869), Vol. L, p. 487 (returns relating to immigration).
149. Supra., pp. 184-186. Also, Cecil Todd, The Cornish Miner in America (Glendale, 1967), pp. 118-119; Report of Captain John Tregonning on the British North American Mining Co. (1849), P.A.C. Pamphlet Collection, Ref. No. 1-2125, n.p.; Report of the Ramsay Lead Mining and Smelting Co. (1863), P.A.C. Pamphlet Collection, Ref. No. 1-3081, n.p.; The Mineral Resources Commission of Ontario. (1890), pp. 94-95. (Evidence given by E.G. Borron.)
150. Supra, pp. 186-187, 189-190, 193, 195-198. Also, Walter William Palmer, "Op. cit.", pp. 175-176; H.J.C. Williams, "Op. cit.", p. 49; The Mineral Resources Commission of Ontario. (1890), Chapter III. (Evidence.); L.W. Bailey, "Op. cit.", n.p.; Report of B.J. Harrington, Op. cit., p. 258; Report of Charles Robb, C.E., Op. cit., p. 287; Report of Royal Commissioner on Coal Mining Disputes on Vancouver Island. (1913), pp. 15-17.
151. Report of the Upper Canada Mining Co. (1848), P.A.C. Pamphlet Collection, Ref. No. 1-2125, n.p.

152. Canada Investigates Industrialism/The Royal Commission on the Relations of Labor and Capital (abridged). (Edited by Greg Kealey) (Toronto, 1973), pp. 399-407; Report of Royal Commissioner on Coal Mining Disputes on Vancouver Island. (1913), pp. 15-17; The Mineral Resources Commission of Ontario. (1890), pp. 103-104, 405-406.
153. Wm. J. Trimble, "The Mining Advance into the Inland Empire" (1914), p. 97.
154. Archibald Blue, "Second Report of the Bureau of Mines (1892)/Section XVI, The Mining Laws of Ontario", Province of Ontario Sessional Papers, (No. 85).
155. The Mineral Resources Commission of Ontario. (1890), pp. 303-304.
156. Ibid., pp. 269-273.
157. Bancroft, The Works of Hubert Howe Bancroft, Vol. XXXII, pp. 392-394, 420-422; Trimble, Op. cit., pp. 206-210; MacFie, Op. cit., pp. 263-265.
158. The Mineral Resources Commission of Ontario. (1890), pp. 273-275.
159. H.A. Innis, "Settlement and the Mining Frontier", Canadian Frontiers of Settlement, Volume IX (Edited by W.A. Mackintosh and W.L.G. Joerg) (Millwood, New York, 1974), pp. 257-258.
160. Innis, "Ibid.", pp. 183-184; Morrell, Op. cit., pp. 380-385.
161. Innis, "Op. cit.", pp. 178-183.
162. Kevin H. Burley, "Preliminary Report on the Klondike Gold Fields", The Development of Canada's Staples, 1867-1939: A Documentary Collection. (Toronto, 1970), pp. 275-277.
163. Innis, "Op. cit.", pp. 197-199.
164. Morrell, Op. cit., p. 396.
165. Supra, pp. 203-204.
166. Morrell, Op. cit., pp. 398-399.
167. Report of the Commissioners to Inquire into the Treadgold and other Concessions in the Yukon Territory, Sessional Papers of Canada (No. 142) (1904).
168. Morrell, Op. cit., p. 399.
169. Innis, "Op. cit.", p. 237.
170. Innis, "Ibid.", p. 207.

171. A.N.C. Treadgold, Report on the Goldfields of the Klondike. (Toronto, 1899), pp. 56-57, quoted in Innis, Op. cit., p. 207ff.
172. Innis, "Ibid.", pp. 237-239, 249-250.
173. The Kootenay region, for the purposes of the present discussion, refers to the region of South-eastern British Columbia drained by the Columbia and Kootenay Rivers. Many of the miners entered the region by following the Columbia and Kootenay from their lower reaches in the United States.
174. LeBourdais, Op. cit., pp. 33-36. Also, Innis, "Op. cit.", pp. 270-272.
175. LeBourdais, Op. cit., pp. 35-36.
176. Trimble, "Op. cit.", pp. 7-12. Trimble, working within the "frontier" tradition of Frederick Jackson Turner, stressed the relationship between the topography of the region and its economic development. In discussing this region, he stressed the topographical unity of the region by using the term Inland Empire, regardless of the fact that an international boundary ran through the centre of it.
177. LeBourdais, Op. cit., p. 38. Also, Innis, "Op. cit.", pp. 274-275.
178. Innis, "Ibid.", pp. 272-275, 281.
179. Innis, "Ibid.", pp. 276-277.
180. Innis, "Ibid.", pp. 275, 279. Also, Robert Chodos, The C.P.R.: A Century of Corporate Welfare. (Toronto, 1973), p. 62.
181. Chodos, Ibid., pp. 62-63. The Crow's Nest Pass Railway's history began in 1886 with the formation of the Crow's Nest Pass Coal Company (chartered in Victoria, B.C.), by Col. James Baker (President)--J.D. Pemberton (Vice-President and Treasurer); W. Fernie, D.C. Fernie, J.H. Humphrey, R. Bray, V.H. Baker, and F.W. Alymer. In 1888 the company applied for a railway charter (Crow's Nest and Kootenay Lake Railway Co.) to run from Michel in the Crow's Nest to Kootenay Lake by way of Cranbrook and the Moyie Pass. The act was amended and changed to the British Columbia Southern Railway in 1891, and in 1894 the railway received a new charter. By 1892 the original backers were running into financial difficulties, and, therefore, entered into an agreement with Messrs. Howland of Toronto and Hanson of Montreal to supply large amounts of capital. By 1894 all funds were exhausted so various attempts were made to arrange outside funding, i.e., the C.P.R., and F.A. Heinze, who was to take a \$500,000 option on six square miles of coal lands but could not raise the funds. The coal company and the British Columbia Southern Railway was acquired by a syndicate composed of G.A. Cox, Elias Rogers, Henry H. Pellatt, J.W. Flavell, H.R. Wood,

- A.N. Amos, and Robert Jaffray. In 1897 an agreement was made with the Canadian Pacific Railway to purchase the railway charter of the British Columbia Southern, while the Crow's Nest Coal Co. retained the coal lands, except for six square miles which the C.P.R. obtained. The Canadian Pacific Railway agreed not to produce coal for ten years while the coal company would ensure traffic for the railway. Crow's Nest Pass Coal and Railway Company (established 1886) (papers), P.A.C. Pamphlet Collection, Ref. No. MG 28 (III52).
182. Chodos, Ibid., pp. 63-64. Also, LeBroudais, Op. cit., pp. 42-43.
 183. Innis, "Op. cit.", p. 314.
 184. Innis, "Ibid.", pp. 291-292, 301-302. Also, LeBourdais, Op. cit., p. 55.
 185. LeBourdais, Ibid., p. 44. The Gooderham-Blackstock syndicate, consisting of W.G. Gooderham, President; T.G. Blackstock, Vice-President; Hon. G.A. Cox, W.H. Beatty, and A.E. Gooderham, also acquired the St. Eugene Mine in 1899, and operated it under the name of the St. Eugene Consolidated Mining Company Limited. Among other interests held by prominent Eastern Canadian capitalists were the North Star Mine near Fort Steele, owned by the dynamic duo of William McKenzie and Donald D. Mann, along with H.S. Holt, of Toronto. A third case of Canadian capital entering mining in this region surrounds the formation of the Granby Consolidated Mining, Smelting and Power Company Limited in 1899. This company developed the Phoenix Mine, originally owned by Jay P. Graves and A.C. Little of Spokane, who turned to Eastern Canada for capital. "The rubber-footware manufacturer, S.H.C. Miner, of Granby, Quebec, and others in the Eastern Townships of Quebec and in Montreal, became heavily interested. Within a short while the Miner-Graves syndicate gained control of the chief companies." Granby continues today under the same name, but it is owned by Zapata Corporation, Houston, Texas. Innis, "Op. cit.", p. 241; LeBourdais, Op. cit., p. 49, 52-53.
 186. Innis, "Op. cit.", pp. 274-278.
 187. Innis, "Ibid.", p. 272.
 188. Innis, "Ibid.", p. 291ff.
 189. Report of Commission Relating to Unrest and Discontent Among Miners and Mine-owners in the Province of British Columbia, Sessional Papers of Canada, 146 (1900).
 190. Mira Wilkins, The Emergence of Multinational Enterprise: American Business Abroad from the Colonial Era to 1914. (Cambridge, Mass., 1970), pp. 136-137.
 191. O.W. Main, The Canadian Nickel Industry: A Study in 'Market Control and Public Policy'. (Toronto, 1955), p. 14.

192. Main, Ibid., pp. 14-15.
193. Report of the Royal Ontario Nickel Commission. (Toronto, 1917), p. 28.
194. Ibid., p. 30.
195. Main, Op. cit., p. 11.
196. Main, Ibid., p. 15. Also, Report of the Royal Ontario Nickel Commission, pp. 33-38.
197. Ibid., pp. 32-41.
198. Wilkins, Op. cit., p. 137.
199. John Deverell, Falconbridge: A Portrait of a Canadian Mining Multinational. (Toronto, 1975), p. 23.
200. Deverell, Ibid., pp. 22-23.
201. Main, Op. cit., pp. 21-29.
202. Main, Ibid., pp. 33-37.
203. Main, Ibid., p. 33.
204. Main, Ibid., pp. 39-40.
205. Main, Ibid., p. 45.
206. Main, Ibid., p. 45.
207. Main, Ibid., pp. 41-44, 66-71.
208. Main, Ibid., pp. 70-72.
209. Main, Op. cit., pp. 95-98; Deverell, Op. cit., pp. 32-34. In describing the promoters of the British American venture, Deverell uses the following:

William MacKenzie, Donald Mann, and H.F. Pearson were members of an elite of "super-promoters" in turn-of-the-century Canada. MacKenzie and Mann parlayed some disconnected railway holdings into a new trans-continental, the Canadian Northern Railway, which as it approached bankruptcy, was nationalized by Robert Borden's Conservative government to become the foundation of the Canadian National Railway. Pearson emerged as a prominent promoter and financier of Mexican Light, Heat and Power Companies, the Dominion Coal Company, and

several Canadian hydro-electric projects. The threesome, along with William Van Horne of CPR fame, worked together in 1912 to incorporate the Brazilian Traction, Light and Power Company. MacKenzie became the first Chairman of Brazilian Traction and the company prospered in Brazil. (Deverell, p. 30ff)

Robert Borden later became a director of British American Nickel Company. Deverell, Ibid., p. 32.

210. Main, Op. cit., p. 43.
211. Main, Ibid., pp. 66-67. Also, Report of the Royal Ontario Nickel Commission, pp. 80-81.
212. Main, Op. cit., pp. 104-106.
213. The Mineral Resources Commission of Ontario. (1890), p. 104.
214. Interview with Fred Wasyluk, Concerning the 1913 Strike at the Garson Mine of the Mond Nickel Co. (Toronto, October 1974).
215. Report of the Royal Ontario Nickel Commission, pp. 225-226.
216. Interview with Fred Wasyluk.
217. LeBourdais, Op. cit., pp. 127-128.
218. LeBourdais, Op. cit., pp. 124-130.
219. Libby and Frank Park, The Anatomy of Big Business. (Toronto, 1973), pp. 201-206.
220. Innis, "Op. cit.", p. 336.
221. Innis, "Ibid.", p. 323,342. Also, LeBourdais, Op. cit., p. 140.
222. LeBourdais, Ibid., pp. 142-143. Also, Innis, "Op. cit.", pp. 344-345.
223. LeBourdais, Op. cit., pp. 154-156, 159-160.
224. LeBourdais, Ibid., pp. 163-164.
225. LeBourdais, Ibid., pp. 164-165. Ambrose Monell, in 1917, was the President of International Nickel, while Joseph R. DeLamar was Second Vice-President. Report of the Royal Ontario Nickel Commission, p. 75.
226. LeBourdais, Op. cit., p. 166.
227. LeBourdais, Ibid., pp. 168-170.

228. LeBourdais, Ibid., pp. 180-183.
229. Innis, "Op. cit.", p. 403ff.
230. Leslie Roberts, Noranda. (Toronto, 1956), pp. 86-88.
231. The Mineral Resources Commission of Ontario. (1890), p. 103.
(Evidence given by H.P. McIntosh, Secretary and Treasurer, Canadian Copper Co.)
232. Donald Avery, "Continental European Immigrant Workers in Canada, 1896-1919: From 'Stalwart Peasant' to Radical Proletariat", Canadian Review of Sociology and Anthropology, 12 (11, 1975, pp. 54-57).
233. Avery, "Ibid.", p. 57.
234. Report of the Royal Ontario Nickel Commission, p. 225.
235. Innis, "Op. cit.", p. 326.
236. "Porcupine Gold Mining District of Ontario", Royal Commission on the Natural Resources, Trade, and Legislation of Certain Portions of his Majesty's Dominions. (London: Parliamentary Papers, Cd. 8459, 1917), p. 307, quoted in Innis, "Op. cit.", p. 362ff.
237. Report of the Commission Relating to Unrest and Discontent Among Miners and Mine-owners in the Province of British Columbia. (1900), p. 18. (Evidence given by B. MacDonald, Manager of the LeRoi group.)
238. In 1931 Quebec and Ontario appear to have an increased involvement of immigrants in its mining industries, which is in an opposite direction to other regions. Prior to 1931, there was continuous expansion of the Ontario mining industry, particularly in the numerous gold mining areas, as well as in the Sudbury region. What is of more interest is the fourteen percent increase in the immigrant component of the mining work force of Quebec since 1921. A possible explanation for such a change lies in the sudden expansion of the mining industry of Quebec, particularly in the North-Western Quebec areas of Rouyn-Noranda and Val D'Or. Because of the relative isolation of this area to the rest of Quebec, the industry had to depend on Northern Ontario as a source of labour for its mining industry, resulting in an increased involvement of immigrant labour which had migrated from mining areas such as Timmins and Kirkland Lake.
239. Innis, "Op. cit.", p. 362.
240. Innis, "Op. cit.", pp. 271, 280.
241. Supra, pp. 201, 208. Also, Report of Royal Commissioner on Coal Mining Disputes on Vancouver Island, pp. 31-32.

242. While the list of job categories for nickel mines included only fifteen entries, as compared with thirty-eight for the coal mines; not included in the list was the wage rates of smelter workers and the various job categories of the smelterworkers. Also, within coal mining there were differences between the various companies, due, in part, to differences in the technology applied, and the relations between the miners and their respective employers. Finally, not included in either of the tables were managerial and overseer categories.
243. Supra, pp. 221. Also, Innis, "Op. cit.", p. 272.
244. Twenty-five Years of Ontario's Mining History. (Toronto: Department of Mines, 1932), pp. 31-33, quoted in Innis, "Op. cit.", pp. 378-379.
245. Twenty-five Years of Ontario Mining History, quoted in Innis, "Op. cit.", pp. 377-378.
246. Innis, "Ibid.", p. 378.
247. Innis, "Ibid.", p. 383.
248. E.S. Moore, American Influence in Canada Mining. (Toronto, 1941), p. 104. As Moore points out, such a change did not occur until after the 1920s, and the position of the prospector declined as mining exploration required the application of complicated technology in order to locate concealed ore deposits. The searching methods of the prospector were based on the discovery of exposed or surface deposits. Moore, Ibid., pp. 104-106.
249. The Mineral Resources Commission of Ontario. (1890), p. 208.
250. LeBourdais, Op. cit., pp. 33-36.
251. Donald Paterson, British Direct Investment in Canada, 1840-1914. (Toronto, 1976), pp. 57-62.
252. Paterson, Ibid., pp. 96-98.
253. Ibid., p. 96.
254. Ibid., pp. 97-98.

CHAPTER V

CONCLUSION

By researching and writing this thesis it was my express purpose to deal with certain inadequacies in analyses of the development of Canada based on the staple thesis. In order to overcome the inadequacies of staple theory, it is argued that the growth in the production of various staple commodities should be viewed as a reflection of the development of the capitalist mode of production, both within Canada and on an international scale (expanding outward from the colonial/imperial metropolitan centre). To evaluate such a hypothesis the concepts of mode of production and capital accumulation on a world scale are introduced in Chapter I, serving as the basis for the analysis of mining as a case for study.

In Chapter II, where staple theory is discussed at some length, it is argued that the staple approach resembles, in certain crucial ways, theories of mercantilism--with emphasis on development as being shaped by the trade in staple commodities in the international market. Within this schema the motor force behind the economic development of a society such as Canada rests in the sphere of circulation of staple commodities with development involving diversification around this export base. Staple production is viewed, therefore, as shaping the development of the social relations of production, and of the productive forces, with such development, in turn, being dependent on demand arising within the colonial/imperial market (sphere of circulation).

On this general theme have been built the numerous variations of the staple thesis, such as are discussed in Chapter II, with such variations normally focussing on the level of development achieved through staple production. More precisely, these variations have attempted to explain the apparent differences between the nature of the economy in Canada as compared to the industrialized nations of Europe, and to the United States, for within Canada there has been a heavy reliance on the export of raw materials (natural resources) as staple commodities. The only major exception to this trend, as is discussed earlier, was W.A. Mackintosh, writing at a time of general economic expansion and development within Canada, who saw staple production as eventually leading to a fully diversified economy.¹ Unlike Mackintosh, the general trend within the staple thesis, as I argue in Chapter II, has dealt with the question of the nature of development associated with (raw materials) staple production.

While a number of writers have approached or emphasized certain aspects of the question of development and staple production, because of the wide scope of his analysis, many have conceded primacy within this area to Harold Innis, and, in turn, claim intellectual inheritance from him.² Innis, as I have pointed out previously, developed an analysis linking the trade in staples and the structure of the staple producing society in a manner such that trade in staples involved not only the movement of commodities, but also of relationships. The character (or structure) of the staple producing society was of a dependent nature,³ due to the hinterland/ metropolis nature of the colonial market. Innis developed, essentially, a model linking the structure of the staple

society to a combination of factors, such as the nature of the staple commodity, geographic factors, technological factors (equipment and organization associated with staple production), and the market context of the trade. Within this paradigm, the structure of society, and, in turn, the relations among and between producers and non-producers is determined by the imperatives of staple production and trade. Each staple, in its turn, left its mark on the staple producing society.⁴ While Innis and others have presented this analysis in regard to the "early" staples, such as fish, furs, timber, and lesser so, wheat, as previously illustrated the question of "industrial" staples such as minerals, pulp and paper, and oil and natural gas have yet to be dealt with.⁵ Particularly, one must determine how mining relates to this framework.

The discussion of mining from a staple perspective, as well as of the other "industrial" staples, has generally been lacking. One must turn to Innis for a comprehensive analysis of mining within the staple perspective.⁶ Unlike the "early" staples, particularly furs and fish, mining was linked by Innis to the achievement of a certain level of industrialism and development, since staples such as minerals and pulp and paper presented the possibility of expansion in the area of manufacturing to supply the staple producing sector (i.e., mine machinery, and lumbering and mill equipment) and the expanding transportation network. Innis' treatment of mining, however, deals with the relationship between the development of transportation networks and the expansion of mining, studying the effect of the development of new techniques within transportation on technological development and change within mining, as well as subsidiary development. Within this analysis Innis did not depart

from the basic relationship between the character of the staple, technique of exploitation, and market demand for the staple, although emphasis was placed on the development of one aspect of techniques of exploitation. Like Innis' other works within the staple perspective, his treatise on mining does not deal with the nature of productive relations associated with staple production. Questions about the relationships of property, class and class conflict, along with the nature of modes of production⁷ within staple producing societies are not treated in such a paradigm.

The development of mining in Canada, as with the development of other staple products, it is argued in this thesis, reflected the process of expansion of the capitalist mode of production, both within Canada and on an international scale (emanating outward from the colonial/imperial metropolitan centre). What is seen in mining is a reflection of the process of transition toward, and development of, the capitalist mode of production within Canada. In Chapter I it is illustrated that this process of transition to the capitalist mode of production involved fundamental transformations in the manner in which men reproduce their existence: in the relations of production (property relations and relations of appropriation, i.e., possession/control of the means of production) and in the corresponding forces of production (labour process and technology).⁸ While it is noted that each mode of production involved not only the economic foundations of a social formation (relations of production and productive forces), but also all expressions of the "life-process" (i.e., political, legal, religious, ideological, etc.) in dealing with mining in Chapters III and IV, the emphasis remains placed on⁹ the economic foundations of the specific modes of production.

In Chapter III, where mining is dealt with on a general level, without reference to one particular society, mining is discussed in terms of the feudal, petty commodity, and capitalist modes of production, doing so in order to illustrate the particular nature of the process of transition to the capitalist mode as it relates to mining. Within mining, this process of transition involved the transformation of the "free" miners of the feudal epoch into a mining proletariat, while simultaneously there occurred an increasing loss of control over, and subordination to, the labour process on the part of the producers and an increased application of technology. In the process the "free" miner, initially a product of the declining feudal mode, developed into a petty commodity producer, succumbing eventually to the growing capitalist mode. The form of labour was transformed, beginning with "free" mining, through tributing, tutwork,¹⁰ piece-work and eventually becoming time-work.

Chapter IV, which deals with the development of mining in Canada, sets out descriptively the process of development of the capitalist mode within Canadian mining, and its interrelationship with the expansion of the capitalist mode internationally. In doing so, the intention is to illustrate that the general process associated with the transition to and development of the capitalist mode within mining, as outlined in Chapter III, was modified in Canada by the particular historical circumstances associated with the development of the capitalist mode within Canada; that while such a transition occurred from a feudal to a capitalist mode of production within Canada the development of mining, as well as of other¹¹ activities, took place at a particular historical juncture in this process. By viewing mining in Canada, first in terms of the development of the

capitalist mode of production within Canada, then as it relates to the expansion of capital on a world scale, this particular historical nature of development of capitalist productive relations within Canada should become apparent.

In the discussion of mining in Canada in Chapter IV, its development was cast in relation to three historical periods, representing different phases of the development of the capitalist mode of production within Canada. Throughout the first period, prior to 1840, mining as well as other activities, reflected the dominance of the feudal/absolutist and mercantilist/colonial forces in France and Britain, in that the dominant mode was essentially pre-capitalist. Internally, Canada was a mercantilist-dominated social formation, as is reflected in the development of the productive relations in the fur trade, agriculture, and whatever mining was being undertaken. Under the French regime there existed a social formation dominated by an advanced phase of the feudal mode of production, in conjunction with the mercantilists both in New France and France associated with the fur trade. Such circumstances were generally not conducive to any industrial or manufacturing activity, including mining, despite the exceptional attempts of Jean Talon and a few others. As noted, even the relatively successful St. Maurice Forges retained a character reflecting the dominance of the feudal absolutist state. The forges, along with other mining activities in New France, tended to be royally chartered operations, obtaining similar rights and monopoly powers as the fur trading interests.¹² However, as Dobb has demonstrated in regard to similar operations in sixteenth and seventeenth century Britain, such endeavours represented the beginning of factory

production, with the bringing together of relatively large numbers of workers and the development of primitive management techniques; this in spite of the relatively primitive nature of most productive activities at the time, and the dominance over production by mercantilist interests.¹³

For the balance of the period, between 1760 and 1840, Canada was part of the British colonial system. Internally, it was dominated by English-Canadian mercantilist interests tied to the British colonial system. In Britain, however, while mercantile capital was dominant, the forces of rising industrial capital were coming into conflict with the mercantilists, a conflict of importance to the structure of the colonial system. Mining throughout this period reflected the dominance of the mercantilist interests in both Canada and Great Britain, as is exemplified by the nature of the productive relations at the St. Maurice Forges which remained virtually unchanged from the French regime.¹⁴ Other types of mining were not developed, while the coal mines of Nova Scotia passed through the hands of a number of concessionaires under royal charter. It was toward the end of the period that any substantial change occurred, with the development of ironworks in Upper Canada, and the lease of all mineral lands in Nova Scotia to the General Mining Association. Such endeavours, however, continued to reflect the mercantilist dominated social formation of the British colonial system, being for the most part representative of the early stages of the transition to the capitalist mode. The ironworks, particularly in Upper Canada, were of a manufactory nature, using relatively primitive and antiquated techniques of smelting. Further, the General Mining Association, while involving relatively advanced operations and organization, reflected similarly the dominance of the mercantile

interests through the monopoly leadehold the Association obtained on the mineral lands of Nova Scotia. This leadehold had no requirement for development of the mineral resources, in effect closing off all mineral lands to exploitation save by the General Mining Association.¹⁵

If the period prior to 1840 in Canada was characterized by pre-capitalist productive relations, the period from 1840 to 1890 saw the transition to, and development of, the capitalist mode along with an eventual decline of petty commodity producers. While mercantile interests were dominant throughout most of this period in Canada, there were also forces of indigenous industrialism. The period beginning in 1840 and lasting variously from 1870 to 1890 is generally considered to be the period of Industrial Revolution within Canada, a period characterized by the growth of secondary manufacturing and expansion into other forms of primary production such as mining.¹⁶ While an increased output of domestic production was occurring, even more important were the circumstances under which this expansion took place. The development of the capitalist mode of production after 1840 was associated with a number of forces both within Canada and outside, particularly in Britain and later in the United States; forces associated with the Industrial Revolution in Canada. In Britain in the 1840s and later in the United States, there occurred a "passage" of dominance from mercantilists to the new industrial bourgeoisie, a change which influenced the structure and ruling groups of the British colonial system. Within Canada challenges were arising to the hegemony of the mercantile interests, such challenges arising from the emerging industrial bourgeoisie. The expansion of the capitalist mode of production, as reflected in mining, initially involved relatively

small units of production, with small labour forces and low levels of technological innovation. As the period progressed, the expansion of the capitalist mode not only involved an increase in the number of units, but also in the size of individual labour forces. More important, however, were the changes at the level of the relations of production and productive forces, as labour initially engaged under various forms of wage contract increasingly tended toward time-work. Similarly, with this expansion, there was an increased application of improved methods and technology. With these developments there occurred a further change at the level of production as the work process was increasingly ceasing to be controlled by the direct producers (miners), but by capitalists, a situation in which the skilled miner (miner by trade) was being replaced by machinery, division of tasks and an expanded hierarchy within the workplace.¹⁷

In conjunction with the transition toward the capitalist mode of production, there occurred in this period an expansion, then a decline, of petty commodity production in a number of activities, including mining. The expansion of petty production in mining initially paralleled the development of the capitalist mode; in time coming into conflict with the capitalist mode, a conflict which eventually led to the decline of petty production.¹⁸

While the period between 1840 and 1890 saw the emergence of the capitalist mode of production, after 1890 one sees at least in mining a filling-out of the capitalist mode, with the near total decline of petty commodity producers in mining. It was during this period that tendencies toward consolidation and monopolization developed, as in mining one finds not only a process of accumulation within mining--the re-investment by

mining companies of profits on existing mines into new mines, but also tendencies toward the vertical integration of mining, smelting, and refining operations, a situation facilitated by the entrance of finance capital. This trend toward monopolization influenced and was influenced by continuing changes in the productive relations and forces of both the capitalist and petty commodity modes. In mining there occurred an unprecedented application of highly developed technology permitting the handling of large amounts of ore. Corresponding with the increased application of technology there occurred changes in the occupational structure with an increased division of labour by task, with mining becoming de-skilled, while management and control of production passed into the hands of technical specialists directly responsible to capital.¹⁹

Parallelling the development of the capitalist mode, there continued a decline of the petty commodity mode as petty producers increasingly became dependent on the capitalist mode, particularly after the height of the Klondike gold rush. In time the petty producer would become a relative fringe person in mining involved predominantly in exploration, eventually being replaced by the technical expert as capital extended its dominance into all facets of mineral production.²⁰

In summary, this thesis, by using mining as an illustration, has attempted to demonstrate that in the period between 1840 and 1920 there occurred an Industrial Revolution within Canada, with the resulting ascendancy of the capitalist mode of production. Further, this process was conditioned by both the internal development of an industrial bourgeoisie within Canada, and the increasing expansion of the capitalist mode on a world-scale associated with the establishment of dominance by

the industrial bourgeoisie, and later finance capital over the capitalist social formation. It has set out to illustrate that the development of the capitalist mode within Canada was not strictly an indigenous affair, but was conditioned by the development of the capitalist mode in Britain and later the United States. The development of the capitalist mode within Canada, for lack of a better term, might be described as a dependent process, for throughout the periods in question mining generally relied on "foreign" sources of technology, skilled labour, and substantial amounts of capital, particularly in the formative period before 1890. The forces which led to the immigration of white settlers were the same forces involved in the formation of a capitalist labour market in North America.

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In analyzing the development of mining in terms of modes of production, this thesis represents an attempt to overcome what were seen as shortcomings of staple analysis as it related to development by linking the development of relations between producers and non-producers within Canada to the development of the capitalist mode of production in the metropolitan centres of France, Great Britain, and the United States. In doing so, however, there still remain shortcomings in the analysis, which point to future directions to follow. Of these, two deserve particular mention. First, parallel studies of other staple production and of manufacturing/industrial activity in light of the analysis developed would serve to determine whether the process noted within mining was peculiar to it, or was representative of a general process within the social formation. Second, within mining further studies of the relationship between the development of the relations of production and productive forces could be undertaken. Specifically, this would involve studying

how the technologies and work relations developed in the Canadian mining industry as a whole were applied in specific types of mining, such as nickel, lead-zinc, gold, coal, etc.

NOTES TO CHAPTER V

1. As illustrated in Chapter II, Mackintosh was the earliest writer within the staple framework, writing at a time when the Canadian economy appeared to be on a general course of expansion and development. See: W.A. Mackintosh, "Economic Factors in Canadian History", in Easterbrook and Watkins (eds.), Approaches to Canadian Economic History. (Toronto, 1967); Supra, Chapter I, pp. 4-5.
2. Supra, Chapter II, pp. 50-51; Mel Watkins, "The Staple Theory Revisited" (unpublished, 1976); Daniel Drache, "Rediscovering Canadian Political Economy", Journal of Canadian Studies, Vol. XI, No. 3 (August 1976).
3. Supra, Chapter I, p. 5 and Chapter II, pp. 57-62; John Warnock, "Metropolis/Hinterland: The Lost Theme in Canadian Letters", Canadian Dimension, Vol. X, No. 2 (June 1974).
4. Supra, Chapter II, pp. 57-58.
5. Supra, Chapter II, p. 96.
6. H.A. Innis, "Settlement and the Mining Frontier", in W.A. Mackintosh and W.L.G. Joerg (eds.), Canadian Frontiers of Settlement, Vol. IX (Toronto, 1936).
7. Supra, Chapter II, pp. 68-71; Stanley Ryerson, "Conflicting Approaches in the Social Sciences", The Marxist Quarterly. (Spring, 1962), No. 1, pp. 59-62.
8. Supra, Chapter I, p. 12; K. Marx, A Contribution to the Critique of Political Economy. (New York, 1970), pp. 20-22.
9. Supra, Chapter I, pp. 6-8; K. Marx and F. Engels, The German Ideology. (New York, 1947), pp. 42-47.
10. Supra, Chapter III, pp. 146-148.
11. Samir Amin argues that the peculiar nature of the development of the "white settler" colonies was a product of the declining feudal and developing capitalist modes in Europe. The European settlers, products of such a transition, provided the basis for primitive accumulation within North America, Australia, and South Africa, through the development of the petty commodity mode in these regions. See: Amin, Unequal Development. (New York, 1976), pp. 365-369. Also, with respect to the United States see: James O'Connor, Review of The Twisted Dream, by Douglas F. Dowd, Monthly Review, Vol. XXVI, No. 10 (March 1975), pp. 49-50. Similarly,

in regard to Canada, the importance of petty producers has been discussed by both Ryerson and Pentland. See: Ryerson, Unequal Union. (Toronto, 1975), pp. 178-182; H.C. Pentland, "The Formation of a Capitalist Labour Market in Canada", Canadian Journal of Economics and Political Science, Vol. XXV, No. 4 (November 1959), pp. 458-461.

12. Supra, Chapter IV, pp. 168-169.
13. Maurice Dobb, Studies in the Development of Capitalism (New York, 1947), pp. 140-143.
14. Pentland, "Op. cit.", pp. 458-461.
15. Supra, Chapter IV, pp. 179-181.
16. Ryerson, Op. cit., pp. 253-260; Pentland, "Op. cit.", pp. 468-471.
17. Supra, Chapter IV, pp. 207-208, 248-249.
18. Supra, Chapter IV, pp. 208-211.
19. Supra, Chapter IV, pp. 232, 249-250.
20. Supra, Chapter IV, pp. 241-243, 250-251.
21. Pentland, "Op. cit.", pp. 458-461; Ryerson, Op. cit., pp. 178-182.

APPENDIX

GLOSSARY OF MINING TERMS

The following is a list of mining terminology used in this thesis. The majority of definitions refers to technical processes and machinery employed in mining.

ADIT

A passageway or opening driven horizontally into the side of a hill generally for the purpose of exploring or otherwise opening a mineral deposit. Strictly speaking, an adit is open to the atmosphere at one end and a tunnel at both ends.

AERIAL TRAMWAY

A system for the transporting of ore or rock in buckets which are suspended from a cable.

ALLUVIAL, ALLUVIUM

Deposits of sedimentary material laid down in river beds, flood plains, lakes, or at the foot of mountain slopes.

AMALGAM

An alloy of mercury with another metal.

AMALGAMATION

A process by which gold and silver are removed from an ore by dissolving them in mercury.

ANODE

A rectangular plate of copper (or other metal) cast in a shape suitable for refining by the electrolytic process.

ARGENTIFEROUS LEAD

Any ores of lead also bearing recoverable amounts of silver.

BACK

The ceiling of a drift, crosscut or stope.

BACKSTOPE

The initial lift or slice when commencing to stope or mine from a drift.

BEDROCK

Solid rock forming the earth's crust, frequently covered by overburden or water.

BIT

The cutting end of a boring instrument. In rock drilling, it is frequently made with ultra-hard material such as diamonds or tungsten carbide.

BLAST FURNACE

A metallurgical furnace in which mixed charges of oxide ores, fluxes, and fuels, are blown with a continuous blast of hot air and oxygen-enriched air for the chemical reduction of metals to their metallic state. Iron ore is most commonly treated in this way, and so are some ores of copper, lead, etc.

BLISTER COPPER

The product of the Bessemer convertor furnace used in copper smelting. It is a crude form of copper, assaying about 99% copper, and requires further refining before being used for industrial purposes.

CAGE

The conveyance used to transport men and equipment in a shaft.

CATHODE

A rectangular plate of metal produced by electrolytic refining which is melted into commercial shapes such as wirebars, billets, ingots, etc.

CHUTE

An inclined opening, usually constructed out of timber and equipped with a gate, through which ore is drawn from a stope into mine cars.

COLLAR

The term applied to the timbering or concrete around the mouth of a shaft; also used to describe the top of a drill hole.

COMPRESSOR

A machine for compressing air to a pressure sufficient to activate mine machinery.

CONCENTRATE

A product containing the valuable metal and from which most of the waste material in the ore has been eliminated.

CONCENTRATOR

A particular type of milling plant that produces a concentrate of the valuable minerals or metals. The concentrate must then be treated in some other type of plant such as a smelter to effect recovery of the pure metal.

CONVERTER

In copper smelting, a Bessemer furnace is used to reduce copper metal from matte, and slagging off the iron; this machine is also used in steel making.

CORE

The long cylinder of rock, about one inch or more in diameter, that is recovered by the diamond drill.

CROSSCUT

A horizontal opening driven across the course of a vein or structure, or in general across the strike of the rock formations; a connection from a shaft to an ore structure.

CRUSHER

A machine for crushing rock, such as a gyratory crusher, jaw crusher, stamp mill, etc.

CUT-AND-FILL STOPE

A method of stoping in which ore is removed in slices, or lifts, following which the excavation is filled with rock or other waste material known as backfill, before the subsequent slice is mined; the backfill supports the walls of the stope.

DEVELOPMENT

The underground work carried out for the purpose of reaching and opening up a mineral deposit. It includes shaft sinking, crosscutting, drifting and raising.

DIAMOND DRILL

A rotary type of rock drill in which the cutting is done by abrasion rather than by percussion. The cutting bit is set with diamonds and is attached to the end of long hollow rods through which water is pumped to the cutting face. The drill cuts a core of rock which is recovered in long cylindrical sections, an inch or more in diameter.

DIP

The angle at which a vein, structure, or rock bed is inclined from the horizontal, measured at right angles to the strike.

DRIFT

A horizontal passage underground along the length of a vein or rock formation as opposed to a crosscut which crosses the rock formation.

ELECTROLYTIC REFINING

The process of refining metals by casting into anodes which are placed in an electrolyte consisting usually of a salt of the same metal dissolved in water, and depositing on a cathode by pressing an electric current into the system; similarly, by using an electrically inert anode, and depositing the metal on the cathode from a purified solution of a salt of the metal.

EM SURVEY

A geophysical survey employing the use of electromagnetic radiations whose effects are measureable by a detecting device.

EXPLORATION

The prospecting, diamond drilling and other work involved in searching for orebodies.

FACE

As applied to a drift, crosscut or stope, the end in which work is progressing.

FLOTATION

A milling process by which some mineral particles are induced to become attached to bubbles and float, and others to sink. In this way the valuable minerals are concentrated and separated from the worthless gangue.

FLUME

A man-made channel for conveying water, often made of wood.

FOOTWALL

The wall of rock on the underside of a vein or ore structure.

FRICTION (KOEPE) HOIST

A mine hoist in which conveyances are suspended from both sides of a simple friction pulley which imparts the desired motion; it is distinct from a drum hoist in which the ropes are wound onto their individual drums.

GANGUE

The worthless minerals associated with valuable minerals in an ore deposit.

GEOLOGY

The science concerned with the study of the rocks which compose the earth.

GEOPHYSICAL SURVEY

A scientific method of prospecting that utilizes the physical properties of minerals to detect their presence. Common properties investigated include magnetism, specific gravity, electrical conductivity and radioactivity.

GLORY HOLE

A large open pit from which ore is extracted, especially where broken ore is passed to underground workings before being hoisted.

GOSSAN

The rust-coloured oxidized capping or staining of a mineral deposit, generally formed by the oxidation or alteration of iron sulphides.

GRUBSTAKE

Finances or supplies of food, etc., furnished to a prospector on promise of some share in any discoveries he makes.

HAND DRILL

A means of boring holes through rock using hand-held steel and a hammer.

HANGING WALL

The wall or rock on the upper or top side of a vein or ore deposit.

HIGHGRADER

One who steals rich ore, especially gold, from a mine.

HOIST

The machine used for raising and lowering the cage or other conveyance in a shaft.

HYBINETTE PROCESS

An electrolytic process for refining nickel.

JAW CRUSHER

A machine in which the rock is broken by the action of moving steel jaws.

LEVEL

The horizontal passages on a working horizon in a mine; it is customary to work mines from a shaft, establishing levels at regular intervals, generally 100-150 feet or more apart.

LOADING POCKET

A station or number of stations in a shaft from where muck (ore) is hoisted to the surface.

LODE

A mineral deposit in solid rock.

LONGWALL

A method of mining coal seams so that no pillars are left.

MAGNETIC SEPARATION

A process in which a magnetically-susceptible mineral is separated from gangue minerals by applying a strong magnetic field; ores of iron ore commonly treated in this way.

MATTE

The product of a smelter, being metal with some contained sulphur. It must be further refined in order to obtain the pure metal.

MEASURE

A general name for stratified rocks, as in coal measures.

MILL

(a) a plant in which ore is treated for the recovery of valuable metals, or concentration of the valuable minerals into a smaller bulk for shipment to a smelter or other reduction works;
(b) a machine consisting of a revolving drum for the fine grinding of ores as a preparation for treatment.

MOND PROCESS

A process for refining nickel by dissolving nickel oxide in carbon monoxide to form a nickel carbonyl gas.

MUCK

Ore or rock that has been broken by blasting.

NUGGET

A water-worn piece of precious metal, usually implying some size.

OPEN CUT

A surface working, open to daylight.

ORE

A mixture of ore minerals and gangue from which at least one of the metals can be extracted at a profit.

ORE DRESSING

The treatment of ore by the removal of some of the waste materials.

ORE PASS

A vertical passageway for the movement of ore by gravity to a central point(s) in a mine where it is crushed and hauled to the surface, either by skip, or by tram, through an adit.

ORFORD PROCESS

A refining process for nickel consisting of a series of "top and bottom" smeltings with coke and sodium sulphate. The final "tops" containing copper sulphide, were leached out, and the product smelted to blister copper. The final "bottoms", containing nickel sulphide, were roasted to form a sulphate of copper and insoluble nickel oxide. This product was also leached to wash out the precious metals and the copper. The nickel oxide remaining was reduced in reverberatory furnaces and cast in molds.

OUTCROP

An exposure of rock or a mineral deposit that can be seen on surface, i.e., it is not covered by overburden or water.

OVERBURDEN

Worthless unconsolidated surface material, such as earth, sand and boulders, covering the rock surface.

PIG IRON

The crude cast iron from a blast furnace.

PILLAR

A block of solid ore or rock left in place for the purpose of supporting the walls or roof in a mine.

PITFACE

The section of a coal mine where coal is presently being mined.

PLACER

An alluvial deposit of sand and gravel containing valuable minerals such as gold, tin, etc.

PNEUMATIC DRILL

A rock-boring machine powered by compressed air. Such drills are either piston drills or hammer drills.

PORTAL

The surface entrance to a tunnel or adit.

PROSPECT

A mining property, the value of which has not been proved by exploration.

RAISE

A vertical or inclined underground working that has been excavated from the bottom upward.

REVERBERATORY FURNACE

A long, flat furnace used in smelting copper concentrates; its principal function is the slagging of gangue minerals, and the production of matte.

ROASTING

The treatment of ore by heat and air, or oxygen-enriched air, in order to remove sulphur and arsenic.

ROOM-AND-PILLAR STOPE

A method of mining flatlying deposits in which the mined area, or rooms, are separated by pillars of approximately equal size.

SALTING

Introducing particles of metal or mineral into a deposit or samples, thus making the assays run higher than they actually should be; done either accidentally or with intent to defraud.

SEAM

Refers to a bed or strata of rock different from the others with which it is associated, as in a seam of coal.

SEISMIC PROSPECTING

A geophysical method of prospecting utilizing the knowledge of the speed and reflection of sound waves in rock.

SHAFT

A vertical or inclined excavation for the purpose of opening and servicing a mine. It is usually equipped with a hoist at the top, which lowers and raises a conveyance for handling men and material.

SHRINKAGE STOPE

A method of stoping which utilizes part of the broken ore as a working platform and as a support for the walls.

SKIP

A self-dumping type of bucket used in a shaft for hoisting ore or rock.

SLAG

The vitreous mass separated from the fused metals in a smelting process.

SLUICE BOX

An artificial trough or flume with ripples for catching alluvial gold when the earth is washed down with water.

SMEETING

A process of extracting metals from ores through the melting of the ores, and separating into matte (the metal) and slag (impurities) with the aid of a flux.

SQUARE-SET STOPE

A method of stoping in which timbers are used for support in underground mining, consisting of cap, girt, and post.

STAMP MILL

A machine in which the rock is crushed by the vertical action of a series of hammer heads or "stamps" upon the rock.

STATION

An enlargement of a shaft made at the level horizon used primarily for the storage and handling of equipment.

STEAM DRILLS

A rock-boring machine powered by pressurized steam.

STOPE

An excavation in a mine from which ore is being extracted or has been extracted.

STRIKE

The direction, that is the course or bearing, of a vein or rock formation measured on a level surface.

STRIP

To remove the overburden or barren rock overlying an orebody.

SUB-LEVEL

An intermediate level or working horizon in a mine opened between main working levels.

SULPHIDE

A compound of sulphur and other elements to form minerals.

TAILINGS

Material rejected from a mill after the recoverable valuable minerals have been extracted.

TERRACE

A nearly level shelve of land abutting on higher ground and dropping off suddenly on the lower side. This steep bank is caused by the former wearing action of some body of water which cut it away.

TRAM

To haul cars of ore or waste in a mine.

TRENCH

A long narrow excavation dug through overburden, or blasted out of rock, to expose a vein or ore structure.

TUNNEL

A horizontal underground passage that is open to the atmosphere at both ends; the term is loosely applied in many cases to an adit, which is open to the atmosphere at only one end.

VEIN

A fissure, fault or crack in a rock filled by minerals that have travelled upwards from some deep source.

WASTE

Barren rock in a mine, or at least material that is too low in grade to be of economic value.

WINDLASS

Machine for hauling or hoisting on the wheel-and-axle principle, with a horizontal axle. Often they were powered by human or animal power.

WINZE

A vertical or inclined opening sunk from a point inside a mine. Similar to a shaft, but the latter starts at surface.

ZONE

An area or region which is distinct from the surrounding structure either because of a difference in the type or structure of rocks, or because of mineralization.

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