

Daly, Herman E

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ECONOMIC GROWTH CENTER

YALE UNIVERSITY

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CENTER DISCUSSION PAPER NO. 80

A MARXIAN-MALTHUSIAN VIEW OF POVERTY AND DEVELOPMENT

by

Herman Daly

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A Marxian - Malthusian View of Poverty and Development

Herman E. Daly
Yale University

I. Introduction. -- The names of Marx and Malthus are often linked in disjunction but never in conjunction.¹ The differences between the prophet and the parson admittedly overwhelm their similarities. Nevertheless, the purpose of this paper is to argue that their differences are more complementary than contradictory, and when combined yield a more general theory of poverty, social classes, and development. Briefly stated, the thesis argued in this paper is that the two historically dominant theories of poverty, the Marxian and the Malthusian,* are not inconsistent, but complementary; that a union of the two yields a basic four-fold typology of social classes by differential ownership of property and differential fertility; that this typology can also be viewed as a way of disaggregating the meaningless average of "per capita GNP" in a way which gives social content (i.e. a distributional dimension) to the concept; that the typology provides more satisfactory definitions of "development" and "overpopulation"; and that these four categories are improved, or usefully supplemented, by replacing the flow of income by the stock of

*To avoid terminological confusion I should define more clearly the somewhat symbolic terms "Marxian" and "Malthusian". From Marx comes the notion of exploitation and class conflict. The historicist side of Marx, dialectical materialism, etc., is irrelevant to the purposes of this paper, and as K. R. Popper argues, probably best ignored in any case. By "Malthusian" I mean to include the neo-Malthusian, or birth control movement, as a logical part of the Malthusian view, with apologies to Malthus, who, of course, rejected it. The terms are labels, and essentialist arguments about what Marxism or Malthusian really is, are not considered worth pursuing. In short, "Marxian" is Marx excluding the historicist part; "Malthusian" is Malthus including the neo-Malthusians.

wealth in each case. Also the universality of the typology is discussed, and the problem of operational definitions and empirical application is considered in a preliminary way.

II. The Complementarity of Marx and Malthus. The importance of the Marxian-Malthusian debate on the roots of poverty has been emphasized by Marxist economist R. L. Meek, who conjectured that, "if the social struggles of the early nineteenth century were essentially summed up in the controversy between Malthus and Ricardo, those of our own times are perhaps not unfairly summed up in that between Malthusians and Marxians."² The issue of our times is economic development rather than the corn laws or the possibility of a general glut. The Marxian and Malthusian differences are apparent in Alfred Sauvy's classification of development efforts into the "economic solution" and the "demographic solution".³ The Marxian tradition is a sub-category of the "economic solution" which denies the relevance of the "demographic solution", the latter being a development of the Malthusian and neo-Malthusian traditions which, however, have historically embraced elements of both the economic and the demographic solutions. Within the common area of "economic solution" shared by both Marx and Malthus there are of course important differences regarding which set of economic institutions, capitalist or socialist, best promotes development. This is in fact, the difference which has absorbed almost all the attention, to the neglect of the equally important difference regarding the relevance of the demographic solution.

This latter difference between Malthusians and Marxians is reflected in the two meanings of the word "proletariat", and the differing theories of poverty implicit therein. The literal Latin meaning of "proletariat" is "those with many offspring", and the full Ancient Roman sense of the word is,

"the lowest class of a people, whose members, poor and exempt from taxes, were useful to the republic only for the procreation of children". The correlation between "proletarian" and "prolific" is implicit in our very language, and is given explicit theoretical development in the Malthusian tradition. The second meaning of "proletariat" is the Marxian definition as, "non-owners of the means of production who must sell their labor-power to the capitalist in order to live". By Marx's time the literal meaning of the word had been lost and it was used as a synonym for "the laboring class, the poor, the common people."⁴ Marx's definition completed the alienation of the word from all connection with its literal meaning. Implicit in the Marxian definition, and explicitly developed in Marxist thought, is the theory that poverty results from the social relations of production, not from the proliferation of the proletariat.

But are these two views really mutually exclusive or logically incompatible? If we consider that poverty means "low per capita income of a class" and that per capita income is the ratio of total income (Y) to total population (P) for the class, then we can say, as first approximation, that the Malthusian tradition explains low $\frac{Y}{P}$ by pointing to a large or rapidly growing denominator and its causes. In contrast, Marxians explain the poverty of a class by showing why the numerator is low or growing very slowly, or even declining. To the extent that Y and P are independent, the two explanations are complementary. Certainly there are limits to the independence of Y and P. Given Y there is a maximum P which can subsist, and a minimum P technically necessary for its production. But within the limits set by subsistence and technology (which grow wider with time) the two terms of the fraction can vary in relative independence, and instead of Marx versus Malthus we have Marx and Malthus.

Within this range of relative independence there of course exist less obvious interrelations between Y and P and between their growth rates. The growth rate of P, and especially the birth rate, influence the age structure of P, which in turn influences savings, education, the size of the surplus available for research and technical progress, etc. P may also influence Y via increased specialization and division of labor as the size of the market expands - assuming the distribution of income does not limit the size of the market. The effects of Y on P are even less clear. The Malthusian viewpoint would suggest that increases in Y cause increases in P by reducing mortality and increasing fertility. But most of the evidence, and the demographic transition hypothesis suggest an inverse relation between income and fertility.⁵ Heer reconciles the two views as follows:

"----. According to this theory, the direct effect of an increase in the level of well-being in a society is an increase in fertility, but various indirect effects of an increase in economic well-being [increased education and not economic cost of children, decreased infant mortality, etc.] have such adverse consequences for fertility that, taking into account both direct and indirect effects, an increase in economic level decreases fertility. One may therefore predict that the zero-order association between economic well-being and fertility is inverse, but the partial association, holding constant the indirect effects of changes in economic well-being, is positive."⁶

Heer's analysis lends statistical support to a generalization offered by Ezra Bowen in 1931 (An Hypothesis of Population Growth, Columbia University Press, New York) that "population size tends to vary directly with the aggregate supply of wealth and inversely with the height of the prevailing standard of living." The same idea was implicit in T. N. Carver's definition of "standard of living" as "the number of desires that take precedence in the individual's choice over the effective desire for offspring" (The Economy of Human Energy, New York, Macmillan, 1924 p. 34). Animal populations have "standards of living" which are constant over time and uniform for all members of the population.

The size of animal populations is therefore overwhelmingly determined by the supply of aggregate "wealth" or means of subsistence. Human standards of living are neither constant nor uniform, and must be added to aggregate wealth as determinants of the population size.

A United Nations' study of conditions and trends of fertility in the world found a remarkably high inverse relation between income and fertility on an international level when the world is divided into two fertility blocs.⁷ Almost all countries with Gross Reproduction Rate (GRR) > 2.0 are in Asia, Africa, and Latin America. Almost all countries with GRR < 2.0 are in the developed parts of the world, and practically no countries have GRR's in the neighborhood of the 2.0 dividing point. The exceptions (high fertility Albania and low fertility Israel, Japan, Argentina and Uruguay) only tend to prove the rule, since for their regions they are not only demographic exceptions, but also economic exceptions and still conform to the rule of inverse association of fertility and economic development. However, within each bloc there appears to be no association at all between fertility and level of development. These facts give rise to a "threshold hypothesis" according to which improving economic conditions are likely to have little effect on fertility until a certain critical level is reached. In terms of Heer's hypothesis one might say that below the threshold the negative indirect effects of income on fertility (standard of living effects) are on balance offset by the positive direct effect (aggregate wealth effect). Above the threshold the negative indirect effects predominate.

There seems to be ample room therefore for treating Y and P independently, and even when Y and P cannot be treated independently there still exist complementarities between the Marxian and Malthusian views, since there is no reason why we cannot recognize two-way causation, with both Y and P capable of autonomous change.

There appears, nevertheless, to exist a considerable difference of opinion among the experts on the compatibility of Marx and Malthus. Paul Sweezy says the following:³

"Marx never wrote much about the factors which determine the size of the population, but this much is certain, that he had no use whatever for the Malthusian theory or any of its variants. He called the theory of population 'the dogma of the economists,' and he scarcely ever mentioned it except to belittle it. ----It would probably be impossible to find in all Marx's writings a favorable reference to the classical doctrine of population.* Clearly he had no disposition to adopt this method of squaring the theory of value with the unique character of the commodity labor-power".

Instead, Marx took Ricardo's ideas on the possibility of unemployment resulting from replacement of labor by machines, and thus got his reserve army whose competition for jobs assured a price of labor-power equal to its

*Indeed Marx's most acid polemics are reserved for Malthus, the "plagiarist" and "sycophant". Regarding Marx's tendency to scorn and belittle arguments without always refuting them, J. A. Schumpeter remarked that, "with Marx, arguments of that type and in that style are always suggestive of some weakness which must be screened." (Capitalism, Socialism, and Democracy). Marx's diatribes against Malthus probably constitute the best example of this.

value (subsistence). Sweezy continues,

"Marx's great accomplishment was the integration of this [Ricardo's] principle into the general theory of capitalist accumulation in such a way as to free the latter from an otherwise fatal dependence on the Malthusian population dogma." (My emphasis).

Marx himself clearly considered Malthus fatal to his system. In A Critique of the Gotha Program Marx considered the "iron law of wages" and observed,

"But if this [Malthusian] theory is correct, then again I can not abolish the law even if I abolish wage labor a hundred times over, because the law then governs not only the system of wage labor but every social system. Basing themselves directly on this, the economists have proved for fifty years and more that socialism cannot abolish poverty, which has its basis in nature, but can only generalize it, distribute it simultaneously over the whole surface of society."⁹ (Marx's emphasis.)

Apparently Marx, like Malthus, could not take seriously the "neo-Malthusian" possibility of halting the generalization of poverty by conscious limitation of births through contraception. To escape the iron law of wages Marx must deny Malthus as well as abolish wage labor.

Joan Robinson, however, takes a view quite different from Sweezy's. She does not consider the Malthusian doctrine at all "fatal" to Marx:

"In his anxiety to combat the reactionary views of Malthus he refused to admit that a rapid growth of population is deleterious to the interests of the working class. This seems to be an aberration, inconsistent with the main line of his theory."¹⁰

In other words Marx and Malthus are not inconsistent, and Marx's denial of Malthus is inconsistent with Marx's main line of theory! It will be seen below that Joan Robinson is quite right, although one doubts that Marx's inconsistency on this point was a mere "aberration".

In view of both the tremendous importance of the population explosion and the pervasive influence of Marxist thought in the third world, as well as the differing opinions of the experts and the lack of a comprehensive theory

of poverty and exploitation -- in view of all this it would seem quite premature to heed the advice of Donald Bogue, "Demographers of the world unite -- in burying the population theories both of Malthus and of Marx".¹¹ It is argued below that a modified Marxian - Malthusian theory of poverty is not only internally consistent, but that the full extent of class exploitation cannot be understood without uniting Malthus and Marx. Also the combined viewpoint suggests a fruitful way of disaggregating the almost meaningless average of "per capita GNP" which is the central concept in so much of our current thinking on poverty and development. This typology, developed in Section IV, distinguishes classes according to their differing participation in and control over the two life-sustaining processes of production (Marx) and reproduction (Malthus).

III. The Concept of 'Exploitation' Modified and Extended. --The word "exploitation" has been virtually banished from polite economics. In price theory it is allowed only when a factor receives less than the value of its marginal product, and the notion is applied to all factors, so that it is possible to exploit land or capital, as well as labor! The act of exploitation occurs between a firm and a factor -- it is a part of micro-economics. Alternatively, exploitation can be viewed as a macro-concept, a relation between classes, not individuals, except very indirectly. The class of capitalists exploits the class of laborers by appropriating the entire surplus (national product excess of "subsistence"). The national product is produced by labor, not property. Capital and land enhance the productivity of labor, regardless of who owns them. We need not appeal to an erroneous labor theory of relative prices which caused Marx so many insoluble problems, but only to a labor theory of total value

of national product. Labor is the origin of total value, not the determinant of relative prices.¹² Once the macro nature of exploitation is accepted and the origin of total surplus value made clear, then the micro question of how individual capitalists share in the total surplus can be explained by the usual market economic theory based on profit maximization and competition. Since competition equalizes the rate of return on capital in alternative uses, the division of the total surplus among capitalists is proportional to the ownership of capital. Like one large "joint stock company" the capitalists share the total profit or surplus in proportion to the number of shares of stock they own.¹³

The notion that the total national product belongs to labor and none to property is a normative proposition. But so is any statement about the proper way to distribute national product. The relevant question is, whose normative claim is stronger, that of labor or that of property? Keynes put the issue very well,

"It is much preferable to speak of capital as having a yield over the course of its life in excess of its original cost, than as being productive. For the only reason why an asset offers a prospect of yielding during its life services having an aggregate value greater than its initial supply price is because it is scarce; and it is kept scarce because of the competition of the rate of interest on money. If capital becomes less scarce, the excess yield will diminish, without its having become less productive -- at least in the physical sense.

I sympathize, therefore, with the pre-classical doctrine that everything is produced by labor, aided by what used to be called art and is now called technique, by natural resources which are free of cost a rent according to their scarcity or abundance, and by the results of past labor, embodied in assets, which also command a price according to their scarcity or abundance. It is preferable to regard labor, including, of course, the personal services of the entrepreneur and his assistants, as the sole factor of production, operating in a given environment of technique, natural resources, capital equipment and effective demand."¹⁴ (Keynes' emphasis).

All value is produced by labor, but is not received by labor. Property gets an unearned income in excess of depreciation, i.e. surplus value. A scarcity price on land and capital (necessary for efficient allocation) is taken to justify a share of national product to ownership.¹⁵ By indulging in commodity fetishism and speaking of the "productivity" of land and capital, we reify and lend an air of "objectivity" to the act of exploitation.

But no exploitation can occur unless there first exists a surplus above subsistence to be appropriated by the owning class. The capitalists set the length of the working day and see to it that it is longer than the socially necessary labor time required to produce labor's subsistence.* What is crucial to exploitation therefore is the length of the working day and the meaning of "subsistence".

No special problems are presented by the length of the working day. It is determined by the capitalists (before labor unions) and is sanctified by long custom. Nevertheless, in spite of its great importance as a socio-economic variable, the length of the working day has never been adequately handled by standard economic theory. The usual Crusoe-like model is that of the individual laborer equating the marginal utility of the wage with the marginal disutility of an extra hour's work. This vision assumes that the laborer sets the length of the working day, which may be true for independent farmers and artisans who own their means of production, but

* If the working class receives more than subsistence, as a result of government intervention, then the appropriation could still be effected through the financial system: the capitalists obtain credit which is spent on investments, which causes inflation, which forces the salaried working class to consume less or "save". But the new assets created in this way belong to the capitalist who borrowed, not the worker who saved.

which is patently false as a general rule in an industrial society.¹⁶ Even with trade unions the length of the working day is a datum to the individual, even though it may be collectively influenced by him through his union. But to recognize this constraint on the laborer in formal theory would not only foul up the mathematical symmetry with the theory of consumer choice, but would also encourage the return of the exorcised ghost of exploitation.

The other part of the concept of exploitation, the notion of "subsistence", is more problematic. Subsistence defies precise definition even if we confine ourselves to physiology and omit what Marx called the "moral and historical" element. Do we mean by subsistence just enough "nourishment" to maintain the "basal" metabolism (or brain waves, or heart-beat?) of an "average" person in a state of "complete" rest at "room" temperature? Obviously not. But in spite of this lack of precision inherent in the concept of subsistence we can define certain maximum and minimum limits from a functional viewpoint. Specifically subsistence is enough to keep all physiological processes, including reproduction, functioning at their full capacity, but not enough to permit accumulation by the working class. Human machinery is not limited in any of its functions by lack of material necessities, given the general state of the arts, of medical knowledge, and the prevailing standards of public health. Any definition of subsistence permitting less than full use of physiological capacity becomes arbitrary -- where do you draw the line? The absolute condition of the worker may improve with the state of the arts (the moral and historical element) but it must never be sufficient to allow the worker to accumulate, lest he become a capitalist. Subsistence is limited, on the one hand, by the necessity of keeping the laborer from perishing, and on the other hand by the necessity of keeping

him from "perishing" out of the laboring class into the capitalist class. Occasionally a worker will starve and occasionally a worker will rise out of the proletariat, but on the average a subsistence wage, by definition, serves to block both exists. In sum, a subsistence wage is one which keeps the average worker and his family in the working class.

The above interpretation of subsistence differs from Ricardo's "natural price of labor" which is "that price necessary to enable the laborers, one with another, to subsist and to perpetuate their race, without either increase or diminution."¹⁷ (My emphasis.) This may be the proper concept from the viewpoint of a strict labor theory of relative prices, but we have discarded that, and empirically this view does not square very well with the fact of a growing population of laborers. Furthermore, Marx seems to have had in mind something nearer to the concept just advocated:

"The labor-power withdrawn from the market by wear and tear and death, must be continually replaced by, at the very least, an equal amount of fresh labor-power. Hence the sum of the means of subsistence necessary for the production of labor-power must include the means necessary for the laborers substitutes, i.e. his children, in order that this race of peculiar commodity-owners may perpetuate its appearance."¹⁸ (My emphasis).

For Marx to define subsistence in the manner of Ricardo as limiting reproduction to an average of two surviving children per worker, would be to admit Malthus through the front door. But if subsistence permits reproduction in excess of replacement, as Marx clearly intends, then we have a whole new dimension of class exploitation. During its lifetime a cohort of laborers produces a surplus product over and above the equivalent of its maintenance, which accrues to the capitalist class. The locus of exploitation is the factory. But during its lifetime the cohort of laborers also reproduces a surplus over and above its own replacement. The locus of exploitation is

the worker's home. It is a brute fact that a well-maintained human organism can produce more than its maintenance over a normal working lifetime, and reproduce more than its replacement over a normal reproductive lifetime. These extra workers, as Marx observes in a different context, "belong to capital quite as absolutely as if the latter had bred it at its own cost."¹⁹ Thus labor is not only a goose which lays golden eggs for the capitalist but also hatches a larger population of new geese which lay golden eggs. This Malthusian dimension of exploitation is not made explicit in Marx, but it is implicit in his overall theory, as William Petersen has clearly perceived,

"If Marx freed Ricardo's theory of the effect of capital growth on employment from a 'fatal dependence on the Malthusian population dogma' as Sweezy declares, this 'great accomplishment' was at the cost of taking the essence of Malthusianism for granted. In the 1930's demographers generally forecast that the population of the West would soon decline, but for Marx this was not even a hypothetical contingency. In this respect his usual historical perspective failed him: he took the rapid population increase typical of the nineteenth century as the norm and built his system around it -- and without even so imperfect a theory as Malthus's principle to account for this increase. If the population were to decline at the same rate as machines displaced workers, then there would be no industrial reserve army, no 'immizeration', no Marxist model altogether. Such an extreme example illustrates strikingly how completely dependent Marx's system can be on the unanalyzed variable of population growth, and this dependence exists to one degree or another, no matter what the rate of growth."²⁰ (My emphasis).

Marx does seem to recognize this dependence, without, however, analyzing its full import. For example;

"The consumption of labor power by capital is, besides, so rapid that the laborer, half-way through his life, has already more or less completely lived himself out. He falls into the ranks of the supernumeraries, or is thrust down from a higher to a lower step in the scale. It is precisely among the workers of modern industry that we meet with the shortest duration of life. ---In order to conform to these circumstances, the absolute increase in this section of the proletariat must take place under conditions that shall swell their numbers, although the individual elements are used up rapidly. Hence rapid renewal of the generations of laborers (this law does not hold for the other classes of the population). This social need is met by early marriages, a necessary consequence of the conditions in which the laborers of modern industry live, and by the premium that the exploitation of children sets on their production." (Capital Vol. I, Chapter XXV, Section 4, p. 318, University of Chicago Great Books Edition.)

"The reproduction of a mass of labor-power which must incessantly reincorporate itself with capital for that capital's self-expansion; which cannot get free from capital, and whose enslavement to capital is only concealed by the variety of individual capitalists to whom it sells itself, this reproduction of labor-power forms, in fact, an essential of the reproduction of capital itself. Accumulation of capital is increase of the proletariat."²¹

The last sentence in the above quotation can be better understood by recalling that in Marx's model of "expanded reproduction" (i.e. capital accumulation), the increment in surplus value is divided by the capitalists into increments in variable capital and increments in constant capital. In making this division the capitalist decides not only the rate of accumulation of physical capital, but also how many workers will be permanently added to the proletariat. Both the physical stock of capital and the live stock of proletarians have their increase financed out of exploited surplus value. But the working class progeny in excess of what can be permanently maintained by the increment in variable capital enter the reserve army and perform the service of holding wages down to subsistence. They also serve who only stand and starve.

It is a curious thing that Marx and his followers have understated in one important respect the true extent of class exploitation under capitalism in order to divert attention (consciously or instinctively) from any Malthusian or neo-Malthusian alternative to "inevitable" revolution as a cure for poverty. The neo-Malthusian alternative is particularly distasteful to Marxists since it is a means whereby the worker can improve his situation by individual action, without appeal to class solidarity. And even if neo-Malthusianism were accompanied by class solidarity, e.g. a greve de ventres to raise wages, it would strengthen rather than abolish the wage system. Clearly Malthus is ideologically inconvenient, and it was more than just an "aberration" on

Marx's part not to admit that "a rapid growth of population is deleterious to the interests of the working class." But logically (as both Joan Robinson and William Petersen have stated) Malthus cannot be gotten rid of. If you define subsistence in a strict labor theory of prices sense (Ricardo), you have wages limiting working class population, which is Malthus through the front door. If you allow subsistence to include reproduction in excess of replacement (Marx), you have Malthus through the back door, i.e. a new dimension of what might variously be termed "livestock", "Malthusian" or "Roman" exploitation²², in which the net increase in the herd of laborers is an increase in the capitalist-herdsman's real wealth. If employed the new laborers increase the capitalists' wealth directly, if unemployed the same effect is provided indirectly by holding down wages. The capitalist pays nothing for the services of the reserve army in holding down wages, and consequently these reserves continually die off, but no matter, they are continually replaced, gratis!

The effect of admitting Malthus is to strengthen the theory of class exploitation. Nor is "Roman exploitation" limited to capitalism. It is even more apparent under slavery. The more slaves the richer the owner. The ancient Romans clearly understood this. It is usually cheaper to capture slaves than to propagate them, but the latter method was used.²³ Regarding feudalism, J. J. Spengler has observed that, "in the Middle Ages the population booster, then a lord, found in his serfs' goodly 'litters' as they were then plainly designated, a source of 'surplus value'."²⁴ Capitalism, particularly when dominated by nationalist or mercantilist philosophies, is no exception.²⁵ Furthermore the Roman or Malthusian dimension of exploitation is intensified as contraception is adopted by the upper class (beginning in the middle of the nineteenth century), but spreads very slowly, if at all, to the working class.

A capitalist monopoly on the means of production becomes coupled with a simultaneous monopoly on the means of limiting reproduction. By withholding contraception from the working class, while at the same time limiting its own numbers, the capitalist class shares the exploited surplus among fewer people. The personal distribution of income becomes even more concentrated.

This second monopoly has often been observed, but seldom given the attention it merits. For example Margaret Sanger (My Fight for Birth Control) tells of poor women begging her to tell them the secret of the rich for having few children. The bitter opposition to Mrs. Sanger's efforts to break the monopoly is a matter of record. Likewise in England before the Bradlaugh-Besant trail in 1876, in reference to which period A. B. Wolfe states:

"Church and State were determined that contraceptive information should be withheld from the women of the lower classes, whose unremitting labor was essential to the development of British export trade. Refusal of the right to this information implied, of course, that people were not to be permitted to put any rational barrier between legitimate sex impulse and its 'natural' outcome in high natality. The sex desire was made the agency of involuntary maternity and put into the service of the state and of capitalistic industry, with a callous brutality which even the Emperor Augustus had not ventured to employ in his famous Lex Papia et Poppaea."²⁶

More recently, and in simpler more direct terms, the diary of a semi-literate Brazilian slum-dweller records:

"In the morning the priest came to say Mass. Yesterday he came in the church car and told the favelados that they must have children. I thought: why is it that the poor have to have children -- is it that the children of the poor have to be workers?

"In my humble opinion who should have children are the rich, who could give brick houses to their children. And they could eat what they wanted."

"When the church car comes to the favela, then all sorts of arguments start about religion. The women said that the priest told them that they should have children and when they needed bread they could go to the church and get some."

"For Senhor Priest the children of the poor are raised only on bread. They don't wear clothes or need shoes." (Carolina Maria de Jesus,

a diary entitled Child of the Dark, New York, Signet Books 1962 pp. 121-22. Originally published in Portuguese as Quarto de Despejo by Livraria Francisco Alves, 1960.)

Readers of Gulliver's Travels may recall how Jonathan Swift makes the same point in describing the remarkable Houynhnms.

"When the matron Houynhnms have produced one of each sex they no longer accompany with their consorts except they lose one of their issue by some casualty, which very seldom happens: but in such a case they meet again; or when the like accident befalls a person whose wife is past bearing, some other couple bestows on him one of their own colts, and then go together a second time, until the mother be pregnant. This caution is necessary to keep the country from being overburthened with numbers. But the race of inferior Houynhnms bred up to be servants, is not so strictly limited upon this article; these are allowed to produce three of each sex, to be domesticks in the noble families." (Gulliver's Travels, Part IV, Chapter VIII, p. 166, University of Chicago Great Books Edition.)

Swift's superior Houynhnms believed in zero population growth as a rational principle. But at the same time the presumption or fact of inferiority for a sub-class of Houynhnms led the superior ones to practice "Roman exploitation". Once the existence of an inferior servant class is postulated, the same enlightened self-interest that leads the ruling class to limit its own numbers, also leads them to favor the increase of the herd of servants.

For Marx, not only would birth control reduce the rate of inflow into the labor force and the reserve army, but it might also increase the rate of outflow from the proletariat into the petty bourgeoisie, as workers with few children might begin to accumulate a small capital. But the proletarians are the grave-diggers of capitalism and it will not do to have fewer of them, nor to have individual proletarians improving their lot by individualist actions, thereby weakening the collectivist solidarity of the founders of the new order. Marx's historicist contempt for individual welfare, which often dominates his humanitarian side, is evident in the quotation below:

"Those who assert, as Ricardo's sentimental opponents have done, that production as such is not the end, forget that production for the sake of production merely means the development of human productive power, that is, the development of the wealth of the human race as an end in itself. If, as Sismondi does, one sets up the welfare of the individual in opposition to this end, this is tantamount to asserting that the development of the species must be checked in order to insure the welfare of the individual -- for example, that wars should never be waged, since individuals are necessarily destroyed in them. Sismondi is right only as against those economists who gloss over this antithesis or deny it. What is not understood is that the development of the capabilities of the species man, although it proceeds at first at the expense of the majority of human individuals and of certain human classes, will eventually break through this antagonism and coincide with the development of the individual person, and that therefore the higher development of individuality can only be purchased through a historical process in which individuals are sacrificed."²⁷ (Marx's emphasis.)

Mankind must be purified in the antagonistic fires of purgatory before reaching the harmonious bliss of heaven! How nice to be born after the purgatorial phase, how unfortunate to be born before!

In summary, although there is an ideological conflict between Marx and Malthus in terms of promoting a single revolutionary cure for poverty, there is no logical incompatibility whatsoever in terms of explaining poverty and exploitation. To arrive at a reasonable union of the two, one need only discard Marx's erroneous labor theory of relative prices, and substitute a labor theory of total value of national product, and add the Malthusian dimension of Roman or livestock exploitation. To explain poverty, which is low per capita income, $\frac{Y}{P}$, we have the Marxian (and classical) tradition explaining class differences in the numerator as resulting mainly from ownership of the means of production. In addition we have the Malthusian and neo-Malthusian tradition explaining class differences in the denominator as resulting from practice versus non-practice of contraception, or ownership versus non-ownership of the means of limiting reproduction. The "means of limiting reproduction" includes not only contraceptive knowledge and devices, but also the minimum of education and motivation necessary for their effective use -- just as by

"means of production" we mean not only machines, but also the technical and managerial will and ability to use them. Could not this simple union of the two historically dominant theories of poverty be made to yield a more useful and informative set of categories than we presently have? This is the topic of Section IV below.

IV. Some Logical Categories Implied by the Marxian - Malthusian View. --

We have defined poverty as a low $\frac{Y}{P}$ for a class; but as yet we have not defined a "class". Our definition of "class" is not in terms of numerical size of per capita income, so that all members of the class would be homogeneous with respect to size, but rather in terms of underlying social characteristics (differential property ownership and differential fertility) which largely determine the size of $\frac{Y}{P}$. Our resulting categories, homogeneous with respect to fertility and property ownership, will contain varying levels of per capita income, but these differing per capita income levels are not the result of differential property or fertility (except at a narrow within-category level), and are determined by chance differences in intelligence, opportunity, preference, etc.* Hence within categories we would expect families to be distributed much more normally about a mean per capita income representative of that class, since the factors mainly responsible for skewness, differential property and fertility, have been held constant. By following the implications of the previous section and moving from a monistic to a dualistic conception of both Y and P, we can make a large gain in within-category homogeneity at

* From a welfare viewpoint the existence of effective choice is more important than the numerical level of a family's per capita income (the family may choose high leisure or many children in preference to a high per capita income). Possession and control the means of production and the means of limiting reproduction are necessary to make these choices effective.

a relatively small cost in terms of multiplying categories.

The Marxian tradition insists on distinguishing two kinds of Y -- that which goes to laborers largely as wages, Y_w , and that which goes to capitalists largely as returns to property, Y_p . Hence $Y = Y_w + Y_p$. These two categories of income follow different laws of growth and embody the fundamental Marxist criterion for class division. Income to laborers and income to property-owners are both functionally and ethically different and should not be indiscriminately lumped together.

The neo-Malthusian tradition distinguishes two kinds of P -- those who control reproduction, P_c , and those who do not, P_n . Hence $P = P_c + P_n$. These two populations follow different laws of growth and embody the fundamental neo-Malthusian criterion for class division. That they really form two statistically distinct populations, at least at an international level, has been shown by the previously cited United Nations' study.²⁰ A frequency distribution of countries by gross reproduction rate (GRR) is strikingly bi-modal. Developed countries have a GRR of less than 2.0, while under-developed countries have a GRR greater than 2.0, with almost no countries falling in the dividing range around 2.0. For high-fertility countries the unweighted mean GRR was 2.94, while for the low fertility countries it was 1.41, or less than half as large. The difference between the two means (1.53) is over 21 times the standard error (0.07), clearly showing that we are dealing with two distinct populations, and that the line of distinction is consciously controlled versus uncontrolled fertility. The previously noted fact that, at the international level, the division of countries by fertility criteria and the division by wealth or level of development criteria tend to coincide, is highly significant.

With two kinds of income, Y_w and Y_p , and two kinds of population, P_c and P_n , we have four possible types of per capita income: $\frac{Y_p}{P_c}$, $\frac{Y_p}{P_n}$, $\frac{Y_w}{P_c}$, $\frac{Y_w}{P_n}$. To each of these types corresponds a social class with its own per capita income distribution. If we know the size and the rates of growth, and the percent of the population contained in each of these four per capita income classes, we would have a vastly better picture than that obtained by lumping everything together. By moving from one to four categories the marginal benefit to the understanding of increased within-category homogeneity is much greater than the marginal cost to the understanding of multiplying categories. By way of analogy with micro-theory the concept of "a market" is not enough. We ask what type of market, and define our types; pure competition, monopoly, oligopoly, monopolistic competition. Likewise we should ask which type of per capita income? Each type of per capita income is indicative of totally different social conditions. Let us consider each class separately.

(1) $\frac{Y_p}{P_c}$. The combination of property ownership and controlled fertility is characteristic of an upper class. We might also label this class the stable bourgeoisie, since with both property ownership and controlled fertility its members are likely to maintain a high level of per capita income. Customs of within-class marriage of properties would further increase the stability of this class. Appealing to whatever connection exists between Protestantism and capitalism we may also call this group the "Protestant capitalists". The rational accounting practices which originated in business have been carried over into the home. A rational barrier is erected between sex and procreation.

(2) $\frac{Y_p}{P_n}$. The combination of property ownership with uncontrolled fertility is characteristic of the middle class. We might also label this

class the unstable or transitional bourgeoisie, since property can be easily dissipated by uncontrolled fertility. Or again this group may be considered "Catholic capitalists". Rational practices of business life have not penetrated the home and there is no separation between sex and procreation. Of course fractionalization of property may be counteracted by primogeniture, entail, and within-class marriage of properties, but then the entire brunt of downward mobility is borne by the younger children. As Peter Laslett has noted,

"He was an acute observer who could recognize that the identity of wealth with status meant that a poor man, even if of gentle birth, might go down in the world. ----Indeed many a gentleman's son at his marriage called himself a yeoman, just as the yeoman's son often called himself a husbandman. Although almost unnoticed by the subsequent historian, social descent was something like an institution of the traditional order in England. ---The complaint that the social system played cuckoo to the superfluous children in a privileged family is far more often met with in the perennial form of the younger brother's lament. ----If daughters predominated amongst his children, inroads into capital would be more difficult to resist, because without dowries daughters, even below the level of the gentry, could not be married at all."²⁹

(3) $\frac{Yw}{Pc}$. The combination of labor income with controlled fertility is also a middle class characteristic. This group could be called neo-Malthusian laborers. Rational accounting was adopted in the home, but since the worker had no capital to manage, we cannot speak of habits of business rationality being directly transferred to the home. This class could also be characterized as the unstable or transitional proletariat, since fertility limitation might make possible the accumulation of a small capital. This is the class which has received most attention in sociological theories of class mobility, eg. the Dumont-Banks model.³⁰ According to this view there is a two-way causality between fertility limitation and social ascent. The desire to rise socially leads to fertility control, because "it is necessary to run fast and not be encumbered by baggage." So fertility control promotes social mobility.

But if there were no chance to rise in the world there would be no motive to control fertility, so opportunities for social mobility promote fertility control. A typical case representative of this important class is the Egyptian guide cited by Alfred Sauvy.³¹

"One day (although he had no idea that I was a demographer), he suddenly told our group: 'you see I have two children and I am quite resolved not to have any more!' On being pressed further he added: 'I was born in a peasant house no better than the one I showed you yesterday (a real hovel). I will also show you my present house, which is made of stone. It is not luxurious but I can live in it, have light in it and my books. How did I get to that point? A little luck perhaps and a great deal of work. I learnt ancient history, English, French, and I am now learning Italian. I intend to give my children a similar education, so that they will not fall back to my earlier level and my previous house. For this, I have calculated, I cannot have more than two.'"

As we were listening to him with the greatest attention, he forestalled an imminent question by adding: 'I am a good Moslem and visit the mosque every day to pray'.

This man, both simple and civilized, was uttering one by one the very words on which a whole doctrine of contraception may be built, words that more or less give the key to economic development and the answer to overpopulation".

A similar insight is expressed by R. A. Fisher, and summarized by J. B. S. Haldane in the following words.

"----in our existing economic system, apart from luck, there are two ways of rising in the economic scale; one is by ability, and the other by infertility. It is clear that of two equally able men -- the one with a single child, and the other with eight children -- the one with a single child will be more likely to rise in the social scale. He may, for example, be able to save money and buy a small shop, and later to become relatively rich. Fisher points out that this was by no means so in the past, when a large family might be an asset to an artisan working at a trade in his own house. There is no question that people tend to marry in their own economic class. In the richer classes according to Fisher, you have a concentration at the same time of genes making for high ability and genes making for infertility." (Hereditry and Politics, New York, W. W. Norton and Co., 1938, p. 130).

For our purposes the important point is not the questionable eugenics, but the obvious eutheic point that apart from luck and ability (i.e. property or privelege in the broad sense), the only other way to rise in the social scale is through infertility.

(4) $\frac{Y_w}{P_n}$. The combination of labor income and uncontrolled fertility is characteristic of the lower class, which we may also refer to as the Classical Malthusian Proletariat. Alternatively, it could be designated the stable proletariat, since there is little chance of accumulation out of a labor income if fertility is not controlled. Or conversely, there is little motive to control fertility if there is no chance of rising out of the proletariat.

To the extent that there is a high positive correlation between high income of the propertied class and the practice of fertility control, and a correspondingly high correlation between the low income of the laboring class and non-control of fertility -- then the middle class or unstable categories (2) and (3) become empty boxes. This would leave only categories (1) and (4), whose basic stability would be enhanced by the absence of any middle class to serve as a communications bridge for facilitating the transfer of information and habits. For many areas of the world, with great disparities in wealth and little or no middle class, this dual classification of per capita income fits the facts quite well. Likewise at an international level, the previously cited United Nations study has shown that wealthy countries have low birth rates and poor countries have high birth rates. The intermediate categories are almost empty, and there is no significant correlation within each bloc -- suggesting the threshold hypothesis previously discussed.

We may take these four logical types of per capita income and apply them to disaggregating the meaningless average of per capita gross national product, as done succinctly in the formula below.

$$\frac{Y}{P} = a_1 \left(\frac{Y^c_P}{P_c} \right) + a_2 \left(\frac{Y^n_P}{P^n_P} \right) + a_3 \left(\frac{Y^c_W}{P^c_c} \right) + a_4 \left(\frac{Y^n_W}{P^n_n} \right)$$

The superscripts are necessary to remind us that in moving from a logical typology to a mutually exclusive disaggregation we have four cross classifications of both Y and P. Thus Y_p^c is income received by those of the propertied class who control fertility, Y_p^n being the income going to property owners who do not control fertility, etc. The a's represent the percentage of the total population belonging to each class. Thus the weighted average $\frac{Y}{P}$ tells us what is the per capita income of the "average person". Alternatively, for the a weights we could substitute b weights with the b's defined as the percentage of total income going to each class. The weighted average $\frac{Y}{P}$ would then be the per capita income size to which the "averagedollar" belonged. Knowing the values of the four per capita incomes, their rates of growth, the values and rates of change of the a's and b's would give us a vastly more complete, and yet succinct, description of an economy. Knowing only the value of $\frac{Y}{P}$ and its rate of change tells us very little since it is consistent with infinitely many combinations of the variables on the right-hand side. The number on the left has no social content. The right-hand side has a great deal of social content, and forces the consideration of this social content in the articulation of national goals. For example, instead of the vague goal of "maximize per capita GNP", we would be obliged to say something about composition -- e.g. maximize $\frac{Y}{P}$ subject to the condition that a_4 decrease over time; or maximize a_1 , subject to the condition and Y/P not decrease; or something similar. In fact, we may use the typology to define more adequately such dialectical notions as "development" and "overpopulation". Development, in this view is a two-dimensional concept: one dimension is an increase in Y/P ; the other is an increase in a_1 and a decrease in a_4 with a_2 and a_3 serving as transitional stages in the transfer. Transferring people from

category 4 to category 1 seems a more fundamental process of development than the usual income redistribution practice of transferring income from category 1 to category 4 (i.e. raising b_4 and lowering b_1), while leaving untouched the underlying social forces which generated the class income inequalities in the first place. At an individual level the movement from category 4 to category 1 represents an increasing participation in both the creation of and the control over the economic surplus, thus increasing the range of choice of each family. "Overpopulation", a notoriously difficult to define concept, may be viewed simply as dependent on the size of a_4 -- i.e. a large a_4 is indicative of overpopulation.

While this four-fold classification is an improvement over the usual single per capita GNP measure, it still shares some of the weaknesses of the latter. In particular the flow nature of the income concept leads to serious anomalies when taken as an index of welfare, as it invariably is. Boulding noted some time ago, apparently without being heard by anyone, that,

"There is a very general assumption in economics that income (or out-go) is the proper measure of economic welfare, and that the more income and out-go we have, the better. In fact, almost the reverse is the case. Income consists of the value of production: out-go is the value of consumption. Both income and out-go are processes involved in the maintenance and expansion of the capital stock. I shall argue that it is the capital stock from which we derive satisfactions, not from the additions to it (production) or the subtractions from it (consumption): that consumption, far from being a desideratum, is a deplorable property of capital stock which necessitates the equally deplorable activities of production: and that the objective of economic policy should not be to maximize consumption or production, but rather to minimize it, i.e. to enable us to maintain our capital stock with as little consumption or production as possible. It is not the increase of production or consumption which make us rich, but the increase in capital, and any invention which enables us to enjoy a given capital stock with a smaller amount of consumption and production, out-go or income, is so much gain."³²

Thus a more meaningful ratio would seem to be capital stock to population --i.e. to redefine the Y's as wealth rather than income, maintaining the same

categories, with the appropriate redefinitions of the a and b weights. The wealth of the laboring class would be mainly the capitalized value of the laborer himself, and his household goods.

Both the stock of wealth and the stock of people are determined by birth (production) and deaths (consumption), and both grow when the former exceeds the latter. A given equilibrium stock can be maintained with a high rate of throughput (income = out-go) or a low rate. In the case of a human population most people prefer a low rate of throughput, since the average age at death is the reciprocal of the rate of throughput. Birth and death rate of 40/1000 annually imply a life expectancy of only 25 years; if we want to live 50 years we must reduce the rate of throughput to 20/1000 annually. Likewise the larger the rate of throughput which maintains the capital stock, the less the durability or the shorter the average age of capital at "death". Even if we had an infinite source of inputs and an infinite sink or dumping ground for final outputs, (waste), it would still make little sense to use throughput rather than stock as an index of welfare. It is positively perverse when we recognize that our sources of raw materials, fossil fuels, etc. are finite and rapidly decreasing, and that our dumping grounds of air and water are also finite and are filling up rapidly.³³ Why the fixation on physical flows? The ultimate physical output of the economic process, like that of the life process, is waste. The satisfaction of wants, or psychic income, is a non-material flow which is proportional to the size of stocks. We cannot measure psychic income, so which physical magnitude, capital stock or income flow, is the better surrogate? The stock of capital, of course. But this would focus too much attention on the question of distribution. What about all the people who own no part of the stock of wealth, save their own bodies? But everyone

receives a flow of income -- call it wage, rent, interest or profit, but it is still income, and we can construct marginal productivity theories to show how "fair" the division of the flow of income is. This could hardly be done if we were to replace the flow of income by the stock of wealth as the central concept. True, income is needed to replace and expand the stock of wealth, and one person may increase his stock above another's by working harder. But the additions to the total stock over one generation are marginal, and for the most part the distribution of stock ownership is a matter of lucky inheritance. But since the flow of additions and subtractions to the stock are influenced by differential effort, all the more temptation to focus on income. This "flow fetishism" of standard economics is very much like Marx's "commodity fetishism" -- it is a habit of thought which shifts attention away from social relations and on to technical relations. Certainly in great measure the depletion and pollution of our environment is the direct result of this "flow fetishism".

Most growth models in the contemporary literature trace the path of aggregate Y/P according to various assumptions, and are quite incapable of distinguishing among the infinitely many combinations on the right-hand side of the equation which may correspond to any single number on the left-hand side. The tacit presumption, if these models are to be included in the economists tool kit rather than in his toy box, is that the four average per capita incomes increase more or less proportionately. If not, then an important element of change is being omitted. A case in point is Northeast Brazil, the largest poor area in the Western Hemisphere, which has had an annual growth rate in per capita income of around 3.4% in recent years. But almost all of this growth has taken place in the per capita income

of categories 1, with that of category 4 remaining constant at best, perhaps even decreasing.* At the same time a_2 has been increasing and a_1 diminishing! Conventional growth models thus leave out the most important feature of economic change in this region. The four-fold typology easily encompasses both even and uneven growth and is sensitive to the differences between them.

If one rejects this four-fold disaggregation of per capita income, one must do it on one of two grounds: (1) that disaggregation is not necessary, in which case it must be argued that even growth of the four per capita incomes is a realistic description of the process of economic growth for all countries. This, as just indicated can be refuted; (2) that disaggregation is desirable, but that the particular Marxian-Malthusian disaggregation here advocated is not a good one. Then, of course, one would be obliged to offer a better one. There may well be a better disaggregation, but in the following section it is argued that the Marxian-Malthusian criteria have a very high degree of universality and deep-rootedness.

V. The Universality and Fundamental Nature of the Two Criteria.

--"The first principle of all human history is, of course, the existence of living human individuals," we are informed by Marx. The continued existence of living human individuals is the result of the two life-sustaining processes of production (to maintain human organisms), and reproduction (to replace human organisms). These two processes then are the most basic in society, and

* See the author's paper, "The Population question in Northeast Brazil: Its Economic and Ideological Implications" in Economic Development and Cultural Change, July 1970.

differential control over them gives us the first principles of division into social classes. Production provides the means for the short-term maintenance (and enjoyment) of life; reproduction provides for the long-term continuation (and enjoyment) of life. The basic social unit in the productive process is the firm, and in the reproductive process the family. In neither case is it the individual who is a long-run disequilibrium process, i.e. he dies. But the firm and the family do not necessarily die, and may be viewed as long-term equilibrium processes capable of indefinite self-replacement.

Given the two fundamental life processes let us note some ways in which they are analogous. Production is essentially reproduction of commodities by commodities. Reproduction is the production of people by people. We have two self-renewing sets, people and commodities, which are dependent on each other for their self-renewal. Both processes require specialization and division of labor, both are time-consuming. The biological term "gestation period" is widely used in economics. The first political economist, William Petty, could not resist calling land the mother and labor the father of wealth, and since earliest times the fertility of soil and the fertility of woman have been associated. The aggregate stocks of people and commodities both have flow birth (production) rates and death (consumption) rates, age structures, and life expectancies (durabilities). From a strictly physical point of view the maintenance of these two stocks is accomplished by the same process: the importation of low entropy matter-energy from the environment, and the exportation of the same quantity of high entropy matter-energy (waste) back to the environment.* Both

* See Erwin Schroedinger, What is Life?

people and commodities are entropy converters, capable of mutually dependent self-renewal as long as the supply of low entropy holds out.

The important question from a social viewpoint is: who controls these two processes and to what purpose? Our social classes are defined on the basis of differing participation in and control over the two processes of production and reproduction. Control over production is, under capitalism, vested in capital, in the broad sense of property. He who owns the means of production by and large controls the process of production and directs it to his own purposes. Property hires, organizes, and directs labor. Our two classes are laborers and property owners -- the fundamental Marxian division of classes. To what end do capitalists control the process? To the maximization of their private profit, according to the classical economists, to Marx, and to the neo-Classical economists.

Control over the reproductive process has likewise been vested in the owners of the means of reproduction -- i.e. under capitalism in men and women who own their own bodies. Under slavery the control over reproduction was still vested in the owner, who was, of course, the master, not the slave. But the "control of reproduction" has, for the majority of mankind throughout history, been left to the natural consequences of the sex urge as unconsciously conditioned by social custom. Only since the middle of the nineteenth century has there been, and only for a minority, an effective rational barrier between the sex act and its natural outcome in proliferation. That the desire for (if not possession of) such a rational barrier, i.e. effective contraception, is a cultural and historical universal has been admirably demonstrated by Norman E. Himes in his classic Medical History of Contraception. The attainment of this desire is relatively recent and

still limited to a minority of the world's people. The incompleteness of what Himes termed the "democratization of contraception" means that the owners of the means of reproduction really do not control the process in any rational sense because they do not possess the means of limiting reproduction. Thus the fundamental criterion for class division in terms of control over the process of reproduction is the neo-Malthusian one of possession versus non-possession of the means of limiting reproduction. By "means of limiting reproduction" must be understood not only the possession of contraceptive devices and information, but also the attainment of a cultural level of self-discipline and understanding sufficient to motivate their effective use.* The latter is indeed the major problem.

On the frontispiece of his classic study, Himes has the following quotation from Lippert: "The farther a notion reaches back into primitive times for its origin, the more universal must be its extent, and its power in history is rooted in this universality." It is to Himes' great credit to have shown that, contrary to popular opinion, the desire to control conception is a cultural and historical universal -- not a recent product of birth control propaganda. The control of numbers (effected by abortion and and infanticide as well as by contraception) is even more universal, extending in all probability back to our pre-human ancestors. It is hardly necessary to argue the universality of property. Both individual and collective property holding has been traced back through human history

* Just as by "means of production" we must understand not only the possession of machines, etc., but also the attainment of a cultural awareness and self-discipline necessary for their effective use.

and into the animal kingdom in the instinct of territoriality.

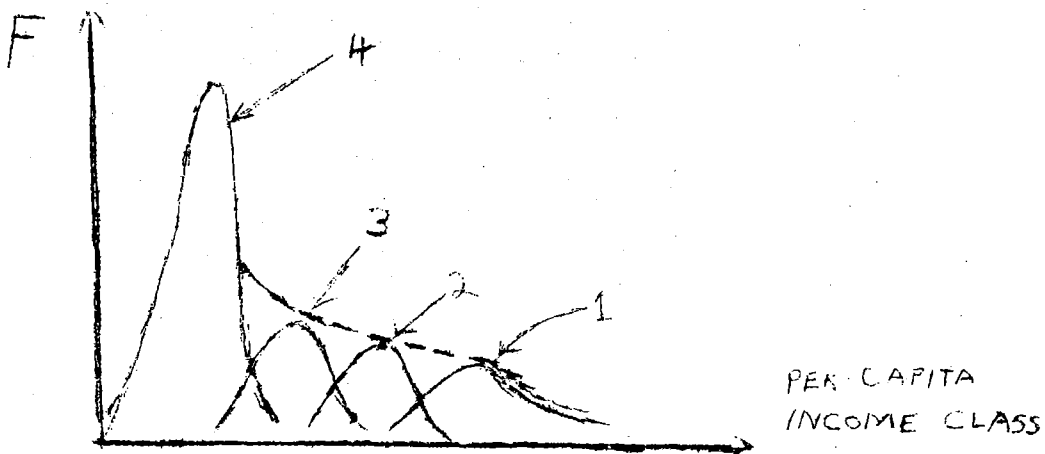
In sum, the deep-rootedness and universality of the two criteria is apparent. Can one imagine more basic lines of division for defining social classes than differential control over the two basic life processes? Is it at all surprising that in the history of economic thought the two great traditions of explaining poverty should have each seized upon one of these criteria as providing the key to understanding and combatting poverty? That the two traditions should have been seen as mutually exclusive substitutes rather than as complements, does require some explanation at the ideological level, and one was offered in sections II and III.

Just about any real or imaginary society could be classified according to differing combinations of values of the a coefficients. For example, a primitive classless society is the case where $a_4 = 1$, with a_1 , a_2 , and a_3 all equal to zero. The future vision of a developed classless society is the case where $a_1 = 1$, with a_2 , a_3 , and a_4 all equal to zero. Present day "dual societies" often correspond to the case where $a_1 + a_4 = 1$, with a_2 and a_3 both equal to zero. Or a pre-demographic transition class society might correspond to the case where $a_2 + a_4 = 1$, with a_1 and a_3 both equal to zero. Other possibilities are easily imagined.

VI. Some Empirical Comments on the Typology. A good taxonomy should reflect the force functions which generate the differences which make classification desirable in the first place. We have two such force functions: one operating through the differential control of production, the other through the differential control of reproduction. Good categories are homogeneous, exhaustive, and mutually exclusive -- but to make reality "conform" to such requirements necessitates either infinitely many

categories, which of course defeats the purpose of classification, or a certain amount of arbitrary Procustean fitting. Even if one lumps all income and all people into one indiscriminate conglomeration, one still encounters a great deal of arbitrariness, as anyone familiar with national income accounting well knows. Our problem of operational definition ideally requires census information on both the practice or non-practice of fertility control, and on the ownership of property by individual families. The fact that this information is not readily available is perhaps not so much due to the statistical difficulties involved as it is to our ideological predisposition not to focus on the controversial area of income distribution. This is especially so if the explanatory sub-categories have to do with the twin sacred cows of property and contraception. Even with minimal data, however, the framework can be useful, as already indicated in the reference to Northeast Brazil.

Each of the four per capita income classes has its own distribution, which a priori one would expect to be roughly normal, since the factors most responsible for skewness in the overall distribution, differential property and differential fertility, have been held "constant" -- also the within-category variance is much less than that of the overall distribution. This leaves mainly random factors, to determine the shapes of the distributions. The four distributions might generally look as in the figure below.



Class (4) would have the lowest average per capita income and the highest frequency. Class (1) would have the highest average per capita income and the lowest frequency. The middle classes (2) and (3) would fall in between, perhaps as shown above, perhaps in reverse order. The four classes overlap to some unknown degree, but the difference in their means is statistically significant, except perhaps for the two middle classes which may overlap to a considerable extent. If we add vertically the frequencies of each curve where they overlap, and plot that sum above (see dotted line), then the first part of distribution (4) plus the dotted line, plus the second part of distribution (1) give the usual skew shape of the overall distribution. To make the sum of the four "normal" distributions form a smooth skew distribution would require very special assumptions about the relative shapes and the degree of overlapping. But of course the smooth curves in both cases are statistical artifacts, fitted to not so smooth scatter diagrams. If we had scatter diagrams for the four classes separately we could fit four overlapping normal curves, or we could throw away information by adding vertically all the points that overlap, and fit a single skew curve to the summed scatter diagrams. The fact that the summed scatter diagram is the one that is available means that we describe income distribution in terms of a single population with a skew distribution, rather than in terms of four populations each with a "normal" distribution.

To go from four distributions to one is easy, but to go from one back to four is like unscrambling an egg -- so it is not a case of two ways of representing the same information. Rather the 4 distribution hypothesis, based on theoretical considerations already discussed, requires more information, but nevertheless is as consistent with existing data (scatter diagrams) as is the single curve hypothesis. Instead of fitting a single skew curve to the scatter diagram (of sums), one could probably obtain an equally good fit by using four normal curves which overlap and differ in height so as to minimize the deviations of scatter from the vertical sum of the curves. The choice between the two would be theoretical, not empirical.

But to get data on the four classes we need operational definitions of the two theoretical criteria of differential property and differential fertility.

Controlled and non-controlled fertility might be operationally distinguished with reference to the finding of recent surveys that almost no one anywhere in the world wants more than 4 or 5 children. If a completed family has 5 or more children we might consider this as presumptive evidence of non-control of fertility. Likewise, completed families with 4 or less children may be classed in the controlled fertility group.*

* A similar criterion was adopted by Lincoln H. Day in his very interesting study "Natality and Ethnocentrism: Some Relationships Suggested by an Analysis of Catholic-Protestant Differentials" Population Studies, March 1963, see p. 32.

Single, non-cohabiting adults would also be classed in the controlled fertility group. The obvious problem is that most families at any given time have not been completed. There is no way to decide whether a twenty-five year old couple with two children is or is not controlling fertility, except to ask them. Thus one possibility is to ask such couples how many children they plan to have and to classify them according to ex ante intentions. Another approach would be strictly ex post, all couples having 4 or less children, would, regardless of age, be classed as controlling. If and when they have a fifth child they would be reclassified into the non-controlling group. In the latter case the age structure of the total population would greatly influence the distribution of people among the four classes. Theoretically this is inconvenient because it allows age, in addition to differential fertility and property, to determine membership in a class. However, we know a great deal about age structures and could to some degree correct for this influence -- we could estimate the degree to which a young population has an exaggerated proportion of "controllers".

For distinguishing the propertied from non-propertied classes we are forced to take an ex post view since it makes little sense to ask young people if they intend to accumulate or even inherit property. But how do we draw the line and what do we count as property? Do we count only real estate, stocks, and bonds? Or do we include human capital such as education, talent etc., and the capitalized value of monopoly power, such as membership in a restricted union or profession, or a degree from a prestigious school, or white skin? And assuming we adopt some definition of property, where do we draw the line? If 70% of national income goes to wages and 30% to property we might say that individuals with over 30% property income

belong to the propertied class. But this requires vast amounts of information at a detailed family level, and is still rather arbitrary.

Many of these basically insoluble problems can be avoided by the following procedure, which is no more arbitrary and requires less information. Say the wage of unskilled labor is L dollars per year. Anyone earning more than, say 2 L dollars per year, is in the propertied class, anyone earning less than 2 L is in the non-propertied class. To earn significantly more than the going wage for unskilled labor one must have some skill, education, talent, land, capital, monopoly power or other privilege. Whether the significant multiple of L be 2 L, 3 L, 1.5 L or any other number is a decision to be based on a complete knowledge of the particular economy. Let K be the appropriate multiple of L.

As an initial suggestion then, our four classes might be operationally defined as follows:

- (1) $\frac{Y}{P/P_c}$ = all families with income greater than k L, and with four or less children.
- (2) $\frac{Y}{P/P_n}$ = all families with income greater than k L, and with five or more children.
- (3) $\frac{Y}{W/P_c}$ = all families with income less than k L, and with four or less children.
- (4) $\frac{Y}{W/P_n}$ = all families with income less than k L, and with five or more children.

These definitions, as previously noted, are ex post and consequently the age structure of the population affects the distribution of families

among the classes, not only in terms of fertility but also from the property criterion, since the young have had less time to accumulate property. But the influence of the age structure could theoretically be corrected for, or at least implicitly taken into account in interpretation.

Data on fertility and income for individual families which would permit such a cross-classification are not generally kept, though certain survey studies may contain this or closely related information.*

To show how, in spite of severe data limitations, these categories might be usefully applied, let us consider the case of Northeast Brazil, which in terms of conventional development criteria has been a great success.** Total GNP for the region has grown at between 6 and 7 percent (say 6.5) annually, with population growing at around 3.1% annually, and per capita income thus growing at around 3.4 percent -- well above the Punta del Este goal of 2.5 percent. Add the fact of sparse density and there appears to be no population problem at all.

But let us apply the concepts just considered in order to go behind the misleading average, and ask what is happening to each type of per capita income and the corresponding social class. As a first approximation let us take a_2 and a_3 to each be zero -- i.e. there is a high inverse correlation between wealth and fertility. In other words, by our definition there is no middle class -- only a stable bourgeoisie and a stable proletariat. What, in terms of income size, might be considered a middle class, is divided

*Further empirical work is needed and is part of a continuing study.

**There is not space here to do more than summarize a few relevant points. For a more complete discussion and references, see the author's paper "The Population Question in Northeast Brazil: Its Economic and Ideological Dimensions", Economic Development and Cultural Change, July, 1970.

between the Marxian - Malthusian bourgeoisie and the Marxian - Malthusian proletariat, most going to the bourgeoisie. If we consider that a typical completed bourgeois family has four surviving children, while a typical completed proletarian family has eight surviving children, then over one generation (say 25 years) the bourgeois family doubles (four children ÷ two parents) and the proletarian family quadruples (eight children ÷ two parents). If over the same 25 year period the total income of each class grows at the same 6.5 percent rate at which the total income of both classes taken together has been growing, then the total income of each class will have increased by a factor of $(1.065)^{25} = 4.8$. Therefore, the per capita income of the bourgeois family will have increased, over one generation, by a factor of $4.8/2 = 2.4$; while that of the proletarian family will have increased by a factor of only $4.8/4 = 1.2$. Even this meager increases of 20% over 25 years for the proletarians disappears when we recall our very optimistic assumptions of continued rapid growth in total income of the region, and of equal growth rates for the total incomes of the two classes. Total income of the proletariat surely grows at less than the average 6.5%, while total income of the bourgeoisie surely grows more rapidly. This is because the proletariat lacks bargaining power due to non-ownership of property, lack of labor unions, and lack of education; and because inflation tends to benefit property income at the expense of labor income, and to benefit those who have access to credit. Thus it appears extremely likely that the per capita income of the proletariat does not increase at all, while that of the bourgeoisie increase very rapidly indeed. The bourgeoisie becomes richer and relatively fewer, the proletariat remains

equally poor, and becomes both absolutely and relatively more numerous. Looking at the left-hand side of our equation we can see only "economic growth". Looking at the right-hand side we are forced to distinguish between "growth" in the sense of "development" and "growth" in the sense of "swelling". And we are led to recognize the key role played by differential fertility in the dynamics of "swelling". The rather more important role of differential property ownership has been more generally recognized intellectually, even if avoided politically.

The "necessity of a population policy as a part of development policy" for Northeast Brazil, was, to my knowledge, first stated with courage and clarity by Rubens Vaz da Costa in an article with that title in 1967. If our informational categories had not been so socially empty, could the nature of the problem have remained obscure until that late date?

Finally, in a world increasingly polarized into right and left, might not the inclusion of the true insights of both the Marxian and neo-Malthusian traditions into our informational categories go at least some distance toward uniting these factions to a common development effort? The underlying moral viewpoint capable of embracing the best in both traditions is that stated in Mark 2:27: "The Sabbath was made for man, not man for the Sabbath." If this rule applies to sacred institutions, then it must apply with even greater force to secular institutions. The institutions, laws, and conventions governing the dual life-sustaining processes of production and reproduction are to serve man, not vice versa. Man was not made to serve Mammon -- nor the goddess of fertility.

FOOTNOTES

1. For an excellent comparison and contrast see William Petersen "Marx versus Malthus: The Symbols and the Men" in The Politics of Population, Doubleday and Company 1964. Also see Samuel M. Levin, "Marx vs. Malthus," Papers of the Michigan Academy of Science, Arts, and Letters, 1936. For both a Western Marxist's view and a collection of Marx's and Engles' relevant writings, see R.L. Meek, ed. Marx and Engles on Malthus, Lawrence and Wishart, London, 1953. For a recent Soviet Marxist view on the Marx versus Malthus theme, see P. Podyashchikh, "Impact of Demographic policy on the Growth of Population" in Egon Szabady, ed., World Views of Population Problems, Hungarian Academy of Sciences, Budapest, 1968.
2. R.L. Meek, op. cit., p. 47.
Incidentally, this appraisal sets Malthus as the intellectual pivot between the major economic issues of two centuries. If we add to this Malthus' influence on Darwin and Wallace and the theory of evolution, his influence on Francis Place and the Neo-Malthusian movement, and his later influence on Keynes and the theory of aggregate demand -- then it would be difficult to find in the last two centuries a more influential figure!
3. Alfred Sauvy, Fertility and Survival, Criterion Books, Inc., New York, 1961.
4. See Goetz Briefs, The Proletariat, A Challenge to Western Civilization, (New York: McGraw-Hill, 1937.)
5. For an interesting discussion of this debate see David Heer, "Economic Development and Fertility" Demography, 1966.
6. Ibid., p. 430.
7. Population Bulletin of the United Nations, No. 7-1963.
8. The Theory of Capitalist Development, pp. 86-89.
9. Karl Marx, reprinted in Robert Freedman, ed., Marx on Economics, Harcourt, Brace, and World, 1961, p. 184.
10. Joan Robinson, An Essay on Marxian Economics, Macmillan, 1966, p. XIV.
11. Donald J. Bogue, Principles of Demography, John Wiley & Sons, 1969, p. 17. It is a bit ungracious to call attention to this one, in my view, piece of bad advice, in what is overall an outstanding textbook.
12. See Joan Robinson, op. cit., pp. VII-VIII. On the question of the independence of the theory of exploitation from the labor theory of relative prices, see

Footnote 12 continued:

also K. R. Popper, The Open Society and its Enemies, Vol. II, p. 176 (Harper Torchback edition, 1966). Though quite sympathetic to Marx's theory of exploitation, Popper feels that Marx does not adequately explain the relative surplus population (reserve army). The displacement of workers by machinery is undeniable, he feels, but so is the employment of new laborers to make machines. One may argue that the net effect may likely be technological unemployment, and yet agree with Popper that this is a bit weak to serve as linchpin for the theory of exploitation, and indeed the whole Marxist structure. According to Popper, "The significance of Marx's analysis rests very largely upon the fact that a surplus population actually existed at his time, and down to our own day (a fact which has hardly received a really satisfactory explanation yet, as I said before)." (P. 179.) In my view it is precisely the Malthusian element which is missing and which provides more solid support for the theory of exploitation.

13. Cf. Karl Marx, in Freedman, op. cit., p. 154.
14. J.M. Keynes, The General Theory of Employment, Interest and Money, p. 213.
15. For an interesting discussion of the conflicts and possible resolutions of "efficiency price" versus "just distribution price", see James E. Meade, Efficiency, Equality, and the Ownership of Property, Harvard University Press, 1965. According to Meade in the United Kingdom in 1959, "no less than 92% of income from property went to 5% of the population" (p. 28).
16. Cf. E. J. Mishan, The Costs of Economic Growth, Frederick A. Praeger, Inc., 1967, p. 115.
17. David Ricardo, Principles of Political Economy and Taxation, Everyman's edition, p. 53.
18. Karl Marx, in Freedman, op. cit., p. 51.
19. Karl Marx, in Freedman, op. cit., p. 174.
20. William Petersen, op. cit., p.
21. Karl Marx, in Freedman, op. cit., p. 171.
22. Elsewhere I have used the term "Roman exploitation". For a justification of the term and a concrete example of its occurrence, see Herman E. Daly, "The Population Question in Northeast Brazil: Its Economic and Ideological Dimensions," Economic Development and Cultural Change, July, 1970.

23. See Edward Gibbon, The Decline and Fall of the Roman Empire, Chapter 2. In between conquests, "the Romans were reduced to the milder but more tedious method of propagation. In their numerous families and particularly in their country estates, they encouraged the marriage of their slaves."
24. J.J. Spengler, "The Aesthetics of Population" in Population Bulletin, June, 1957.
25. E.S. Furniss, The Position of the Laborer in a System of Nationalism.
26. A.B. Wolfe, "The Rationalization of Production and Reproduction", in N.E. Himes, ed., Economic, Sociology and the Modern World, Harvard University Press, 1935.
27. Karl Marx, in R.L. Meek, op. cit., p. 119.
28. Population Bulletin of the United Nations -- No. 7 -- 1963, United Nations, New York, 1965.
29. Peter Laslett, The World We Have Lost, Charles Scribner's Sons, New York, 1965, p. 187.
30. See William Peterson, Population, Macmillan, 1969, p. 500.
31. Alfred Sauvy, op. cit., p. 164.
32. Kenneth E. Boulding, "Income or Welfare?" Review of Economic Studies, (1949-50) p. 79.
33. See K.E. Boulding, "The Economics of the Coming Spaceship Earth" in Henry Jarrett, ed., Environmental Quality in a Growing Economy, Johns Hopkins Press, 1966.