

WORLD INDICATORS

1. *On goals, indicators and operationalization*

Today, most people do not seem to understand how vitally significant the discussion about "social indicators" is; and how powerful the people who decide over them are. The discussion is found everywhere, in intergovernmental organizations and in ministries, at universities, research institutes, in political parties, etc.¹ Mostly, however, it is conducted at a technical level among experts. The discussion looks innocent enough - "only" statistics and mathematical formulas. But each social indicator represents a goal,² openly or in disguise, and when the ruling indicators are decided by the ruling people in the ruling countries, then they are likely to reflect their vested interests. Thus, "per capita gross national product" probably looked like an expert abstraction when it first emerged.³ By now the indicator has become an institutionalized goal; and since this indicator measures the level of processing and marketing in the economy - and not, for instance, the degree of satisfaction of fundamental needs - it defines development in a way that serves to put today's ruling countries in ruling positions.⁴

The following is an effort to broaden the spectrum of social indicators so as to include goals of the political left.⁵ There is something contradictory in that process, for such dimensions should not be decided on by scientists, experts, politicians or other elite persons. *People themselves should decide the goals, their implementation and operationalization.*⁶ But in a world so distorted by vertical division of labor and professionalism as today's world, this will happen only rarely. It becomes important that counter-elites also work out indicators and show by contrast how narrow and politically biased current indicators are, to make the debate both broader and more public.

The present effort attempts not only to broaden the scope of social indicators, but also to extend their *domain*, from indicators for the country to indicators for the world, global indicators. The idea that the state of the world is equal to

the sum (or the average) of the state of its component countries is a reflection of a liberal, actor-oriented, structure-blind view of the world. For the world also has a structure, it is not only a set of actors.

To develop this further, we need an *image* of the world, as a prerequisite for any choice of dimensions. The image suggested as a general point of departure is the following:

The world consists of

Level 0: Nature, N

Level 1: Individual actors, I

Level 2: Collective actors, of two kinds

- territorial actors, T

- non-territorial actors, NT

Level 3: World, W

or:

$$W = N + I + T + NT$$

Thus, the world consists of finite Nature, in and by which individuals live. These individuals are, however, organized in territorial and non-territorial actors, both of which interact and form structures. From a global point of view the most important territorial actors are the *countries*, territorially contiguous polities; and the most important non-territorial actors are the multinational associations and organizations, whether *governmental* (intergovernmental organizations, IGOs), or *non-governmental* (inter-nongovernmental organizations, INGOs), *non-profit* or *profit* ("business", BIGOs in the governmental case and BINGOs in the non-governmental case) - or *transnational* with individuals, not national governments or other national groups as members (TRANGOs). And then there are the non-crystallized, even emerging, territorial and non-territorial actors, separatist minorities, informal movements.

With this as a point of departure, "world social accounting" could have five parts:

(1) W, N: the world as an *eco-system*, including man, with its balances and imbalances.

(2) W, I: the world as a *society of individuals*: if the world were one country, what kind of country would that be?

- (3) W, T: the world is a *community of countries*:
what does this world look like?
- (4) W, NT: The world as a *community of organizations*:
what does this world look like?
- (5) all: the world conceived of as nature, individuals,
countries and organizations: how do they all
interact?

Under the first heading one would study depletion and pollution of the water, oxygen and protein sources; the sources of energy, the world temperature situation, etc. Under the second heading one would for instance look into world demography, as questions about the world demographic and occupational distribution, etc., disregarding the collectivities intervening between world and individual levels.⁷ That would come under the third heading: the world would now appear as a set of countries, and under the fourth heading as a set of organizations, and the distributions and structures of these sets of countries and organizations would be investigated. Finally, this would all be put together, in ways to be specified later.

This world is like Chinese boxes: actors within actors. Since our basic concern is with the *good life* of individual human beings, given a finite world and the organization into collectivities, with distributions and structures, we are immediately led to the problem of the *good collectivity*, defined as the collectivity that permits the good life for its members. But since the world is itself a collectivity of collectivities, this leads to the problem of the *good world*. In so doing we would like to reason from the individual through the collectivity to the world, and not vice versa. If it is done the other way round one is so often led to non-human, even anti-human, abstractions. For instance, if we start by saying that the good world is a world without war, that this is found in a hierarchical world where a group of strong countries dominate the rest, and where the countries are built according to the same model, with groups of strong people dominating the rest, then the net result is a world with a tiny minority of the strong in the strong countries living very good lives and a majority of the weak in the weak countries leading a life in squalor. Many other examples could be given of the danger of starting with the collectivities - $GNP/capita$ being one of them.⁸

Hence, we are led to the problem of analysis at different levels, including analysis of the relations between the levels. Just as we want to use the same dimensions for analysis of the present, the preferred, and the rejected worlds - for data theory and values - we would also like to use the same dimensions for analyses at the individual, the collective, and the world levels. The world cannot afford any longer this fragmentation of knowledge, and one way of counteracting is to try to develop a rich, common language for empirical, theoretical and axiological analysis, regardless of level.⁹

In this effort, it is found that the fundamental distinction is one of basic perspective rather than the weight given to data, theory or value, or level of analysis. We have referred to these perspectives as the *actor-oriented* and *structure-oriented* perspectives, respectively.¹⁰

According to the former, any collectivity is a set of actors that can be classified and enumerated in various ways. More particularly, the actors can be classified according to two types of attributes: *being*, what they *are* - and according to *having*, what they *have*.¹¹ In either case *distributions* can be defined, and the appropriate social indicator will be some kind of *statistical parameter*. The language of operational discourse is *arithmetics*.

These simple thoughts give rise to five kinds of goal dimensions for a collectivity - to be explored in some detail below.

- (1) Based on level of "being": *personal growth*
(alienation)
- (2) Based on dispersion of "being": *diversity*
(uniformity)
- (3) Based on level of "having": *socio-economic growth*
(poverty)
- (4) Based on dispersion of "having": *equality* (inequality)
- (5) Based on covariation of "being/having": *social justice*
(social injustice)

In parentheses we have put the antonyms, standing for what is generally regarded as bad. Thus, the basis here is a view of a

collectivity as a distribution of actors; a distinction between what an actor *is* and what he *has*; and a short list of the simplest parameters that can be used.

According to the latter, the structure-oriented perspective, any collectivity consists of social positions connected by interaction relations and interaction patterns, together with forming a structure. Development does not consist primarily in changes in the distributions of attributes, but in structural changes. Some representation of the structure will have to be developed, for instance in the form of *graphs*, and the appropriate indicator will be some kind of graph parameter. The distinction must then be drawn between structural properties that relate to the *interaction relation* as such (e.g. to an exchange relation) and to the *interaction pattern*, where more than two positions are involved. The language of operational discourse is *geometry*.

More particularly, this gives rise to four kinds of goal dimensions for a collectivity - also to be explored below:

- (6) Based on interaction relation: *equity* (inequity, exploitation)
- (7) Based on interaction-relation: *autonomy* (penetration)
- (8) Based on interaction pattern: *solidarity* (fragmentation)
- (9) Based on interaction pattern: *participation* (marginalization).

In parentheses we have once more put the antonyms, in order to anchor the dimensions in two points. Thus, the basis here is a view of a collectivity as a structure, consisting of the *interaction relation* (which we take to be bilateral) and *interaction patterns* (which we conceive of as multilateral).

And then there is a tenth goal dimension, arising from

collectivity as a structure, consisting of the interaction *relations* (which we take to be bilateral) and interaction *patterns* which we conceive of as multilateral).

And then there is a tenth goal dimension, arising from the inclusion of nature in the equation for the world:

- (10) Based on the eco-system: *ecological balance*
(ecological imbalance).

Being so fundamental it might have been placed first on the list.

This presentation is so brief as to be almost meaningless. The theoretical rationale has been given elsewhere,¹² it applies to collectivities of individuals as well as to collectivities of collectivities - across levels, that is. Below we shall try to inject meaning into these concepts through operationalization. But first some exploration of the problem of operationalization, in general. Operationalization has to be argued, it is not self-evident. It can easily become an empty, distorting exercise. To operationalize a dimension is to indicate a procedure whereby the position on that dimension can be given an algebraic, usually numerical, expression. There are at least five good reasons for trying to do this.

First, operationalization forces *precision* on us. We have to specify exactly what is meant by the dimension; we are forced away from slogans. If the result is supposed to be a number, no vagueness is permissible. Obviously, this demand for precision may be exaggerated and lead to caricatures for the sake of operationalization. Usually, or at least very often, an operationalization is able to capture only one aspect or connotation of a goal dimension, and not the many surplus meanings that richer minds have been able to infuse it with. But this can be seen as an argument for *better* conceptualization, exploring separate sub-dimensions of a concept, and for *better* operationalization, rather than for no operationalization at all. Operationalization, carefully practiced, may become a way of making slogans and catch-words more meaningful.

Second, operationalization is a potential instrument of *practice*. Operationalization not only makes the dimension more

precise and communicable; it can also indicate processes and component actions needed to increase the level of value-realization along the dimension. It should indicate practical operations, not only operations with numbers. Above all, it should not merely be a formula chosen ritualistically from the storehouse of descriptive statistics. When *good* operationalization has been found, communication about the value for the purpose of practice and action, not only of theory and philosophy, is facilitated. Thus, one reason why economic growth is so dominant in people's minds is its operationalization (in terms of annual increment in GNP, GDP or NI (national income)); in absolute terms, or per capita. *The formula for GNP is also a formula for how to increase GNP.* That it does not reflect women's work in the home, or farmers' production for own consumption adequately; that it is secondary and tertiary sector oriented, measuring the degree of processing and marketing, i.e. the power position of a country in the international vertical division of labor, is easily forgotten. But it does explain quite well the popularity enjoyed by the measure in rich societies. Correspondingly, *one* reason why economic equality is less on people's minds is the lack of good operationalization. True, it is mainly the other way round, that vested interest in economic growth leads to GNP operationalization, and vested interest in inequality to little concern with *its* operationalization. But operationalization may also stimulate interest. Thus, to take a third example: most people would like to have "richer lives" leading to personal growth, but this desire might more easily be translated into action if someone offered an operationalization that also had the merit of being practice-indicative.

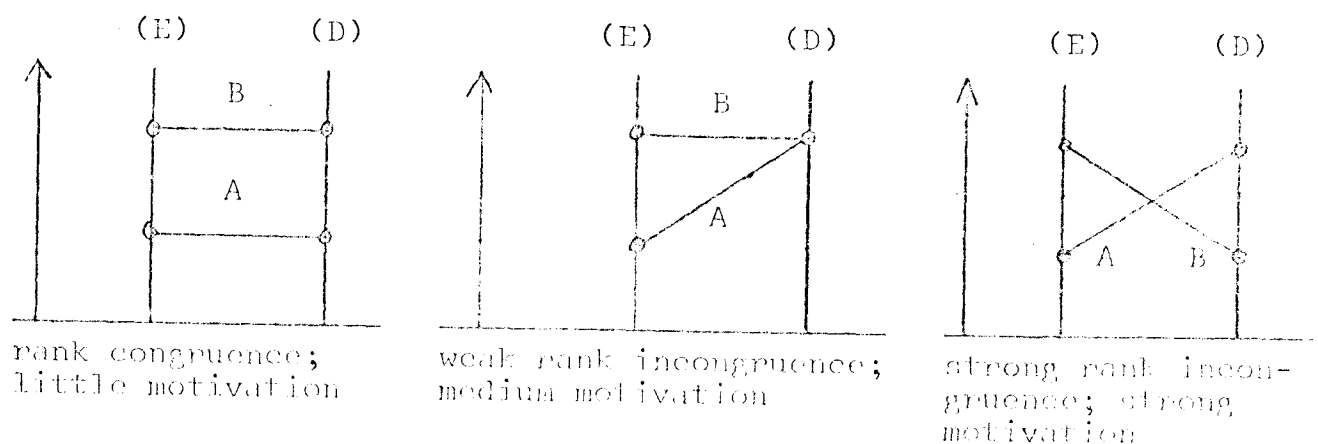
Third, in a sense underlying the preceding point: operationalization makes *comparisons* possible. We are thinking of two types of comparisons: *synchronic*, whereby a country is compared with other countries at the same time, and *diachronic*, whereby a society is compared with itself over time, including itself in the future. Both comparisons make sense in a world bent on achieving these goals: a society may evaluate itself relative to others (synchronic), and/or it may check how it is doing over time (diachronic). In either case operationalization may serve as a stimulus for action; if in addition operationalization is practice-indicative, its practical value should be obvious.

In connection with this last point there is a particular mechanism worth pointing to as a typical example of the significance of operationalization. What propels societies into action when they are carrying out their synchronic and diachronic comparisons seems to be not so much comparisons based on *one* goal-dimension alone, as comparisons based on *two* dimensions. This is where rank disequilibrium¹³ and rank incongruence¹⁴ enter as powerful motivators for concrete action. Basic comparisons, synchronic as well as diachronic, are bivariate, not univariate.

Thus, imagine the concern is with educational (E), and economic growth (D), as two aspects of socio-economic growth. If country A lags behind country B on both, this may not lead to any action in A: country B may simply be seen (by policy-makers in A) as more "developed". But if they are at the same economic level, and B nevertheless is far ahead in education - or worse still, if B is below in economic level, yet above in education - then a strong motivation to "catch up" may be the result. The more similar they are, the more will one dissimilarity stand out and the motivation may be acute. Correspondingly, if A compares itself diachronically with itself and finds economic progress but no growth in education - educational rates may even have fallen - a very strong motivation for "restoring the balance" may ensue.¹⁵

The three situations can be pictured as follows, regardless of whether the comparison candidate B is another country or the country itself at some other period in history:

Figure 1. *Three cases of international comparisons*



Such precise comparisons can be made only if an operationalization exists, otherwise they will become mere intuitive guesses, more

or less educated. And for the comparisons to be made there must be some comparison market in which A and B meet. For $A \neq B$ the international system is that market, particularly the international organizations. For $A=B$ history is the market.

Fourth, not only the relative values of indicators, but also their *absolute* value may often stimulate, even impel, actors into practice. Low GNP/capita, as an indicator of poverty, has long served as a signal that gets bureaucracies (i.e. highly institutionalized actors) moving into action, and so do some indicators of ecological imbalance. Why should not the same happen in connection with indicators of much more complex goal-dimensions, such as personal growth, diversity, equality, justice, equity, autonomy, solidarity and participation? Why should not minimum levels of tolerance be established? Again, the elaboration of such indicators and minimum levels is obviously more of a necessary than a sufficient condition for action, but that should not serve as an excuse to postpone this significant task.

Fifth, there is the need for operationalization as a tool for exploring empirical relations, and for theory-formation, with a view to *critical and constructivist analysis*. Even operationalization that does not yield more than weak levels of measurement (such as nominal and ordinal levels) can be used as an empirical basis for theoretical work. As typical examples may serve the two types of analysis briefly touched upon above: bivariate synchronic analysis (BSA) and bivariate diachronic analysis (BDA).¹⁶ In the former there are two dimensions, and countries are measured on both at the *same* point in time to see how they *cluster*. In the latter there are also two dimensions, but this time one country is measured on both levels at *several* points in time to study its *trajectory*.

Thus, imagine good operationalizations existed for economic growth and for economic equality. By means of BSA one would gain insight into how these variables correlate, whether the tendency is for the rich to be more or less egalitarian than the poor, and so on. By means of BDA one would gain insight into how a country may change through time - is there first growth on one of them, then on the other, or is the growth more "balanced"? Any generalization from a BSA to other points in *time* - claiming invariance

to a finding with no understanding of context and historical factors - and any generalization from a BDA to other societies, other points in *space* - must remain conjectures. Multivariate rather than bivariate analysis will not make generalization less conjectural. There are many ways of gaining insight, none is perfect, but these two methods seem to be among the fundamental ones, and some level of operationalization is a necessary condition for doing empirical work with them at all. Another necessary condition, usually not fulfilled, is that the indicators be linked to each other and not represent separate, completely disparate departures that converge neither empirically, theoretically, nor axiologically. In short, dimensions as well as indicators have to derive from some common basis if they refer to the same basic concern.

It is, then, our contention that the two bases we have chosen - the actor-oriented and the structure-oriented perspectives - do that job for us. In operational terms, the former leads us to distributions, and the latter to structures represented by graphs - and we shall try to show that even simple aspects of these distributions and graphs can yield some sensible operationalizations of very lofty goals.

2. *Operationalization of the actor-oriented goals*

The wrong approach would now be to copy slavishly the most consistent family of parameters available from mathematical statistics, the moment-based family comprising arithmetic mean, variance, and product-moment correlation coefficients. These are all based on mathematical operations that make for great mathematical elegance and pay fat dividends in theoretical statistics (e.g. in the theory of statistical testing): but they are not indicative of any practice. No government - or anybody else for that matter - would ever carry out anything corresponding to the operations underlying the calculation of a variance, not to mention the Pearson type of correlation coefficient. No, we must look for more adequate parameters and be systematically critical in our search.

Let us then discuss operationalization of the values one by one.

(1) Personal growth

There is "outer man", the body, and there is "inner man", the personality, the mind, the soul - and by "personal growth" we refer to both. In the word of Christian Bay The Most Basic Rights are: "(1) to stay alive, (2) unmolested and (3) free to develop according to inner propensities and potentialities, in that order". We shall also treat them in that order.

The extent to which a person "stays alive" is measured by means of *life expectancy*, which clearly is one crucial social indicator. It can be made age- and sex-specific, but probably serves its purpose quite well as generally calculated. Of particular interest, also, is *infant survival* (the reverse of the usually given negative indicator, infant mortality).

However, in a sense more significant than these indicators of the general state of health are the indicators of factors that prevent people from staying alive. Clearly, these are indicators of *violence*. Violence can be *direct* as when people are killed; it can be *structural* as when life expectancy depends heavily on position in the social structure.

The simplest indicator of *direct violence* is probably still *homicide and suicide per capita*, depending on whether the killing is attributed to others or to oneself. The difficulties with these rates are well known, but considerable effort goes into collecting the data and the vast literature indicates their usefulness as indicators.

Indicators of *structural violence* cannot be that simple, for it is not simply a question of counting the number of deaths of a certain type. Of course, there may be special diseases, e.g. those caused by pollution or accidents of certain types, for which this approach should be used. But generally speaking structural violence is a concept at a higher level of abstraction. The basic idea is that although we all eventually die there is such a concept as "premature death". This we know, because we know that with some changes in social structure in general and health structure in particular life expectancy can be improved considerably. More particularly, it may be possible to give to the whole population the life expectancy of the class enjoying appropriate health

standards, e.g. the "upper classes". The level enjoyed by them would be an indicator of the *potential* possibility to "stay alive" in that society; for all but the upper classes that would be above the *actual* possibilities to stay alive. The difference, *when avoidable*, is structural violence. What it means is that a person has less possibility of staying alive than he or she would have had when born into a different position in the social structure. The difference, in very concrete terms, is not a lost life, but so and so many lost years of life. If, for instance, in a country whites have a life expectancy of 65 years, blacks 55 years and Indians 45 years, then twenty years of living, or almost one third of their lives, are taken away from the latter. Clearly, this is under the assumption that all groups will have the same life expectancy when growing up under the same conditions.

To develop indicators of structural violence of this type is of prime importance in order better to realize the magnitude of the problem. To do this the following components are needed:¹⁷

- a basic structural variable, such as race or class
- demographic distribution as a function of the variable
- life expectancy as a function of the structural variable, the *actual* level
- attainable life expectancy under the assumption of changes in social structure and health structure - the *potential* level.

Of these components the first and the fourth are "subjective" - the second and third are given once the first component has been defined. Clearly, it has to be defined in a meaningful, common sense manner - as indicated - and may not easily be comparable from one society to another. Comparisons over time within the same society may, however, be more meaningful since our basic concern would be with how societies change and transform. And as to the fourth component: One could here operate under a number of assumptions. In any case the typical model of potential level would be "flat", that life expectancy does not vary with position in the structure. But *which* flat level is another matter. The average for the "upper classes" will depend on how those classes are defined, and also on how attainable a general distribution of

their life chances would appear to be. This needs not worry us, however, for structural violence can be estimated relative to a general life expectancy of 65 years, 70 years, 75 years, etc. What matters is the departure of the actual life expectancy from any potential line, and how that departure is weighed by the population distribution.

In general it might be useful, as indicated above, to have the amount of structural violence converted into *lost lives*, not only into *lost years alive* - as indicated in the example above. It is important, in order to bring out clearly the truth in the saying that "war in the Third World is called poverty", and that this form of war is not unknown in many rich countries.

Let us then move from "stay alive" and *mortality* considerations to "unmolested" which should lead us to *morbidity* considerations. A person can stay alive but heavily molested due to psychic and somatic diseases. One way of bringing this in would be the traditional way, by means of *morbidity rates* of various kinds. The difficulty is to find indicators that do not simply reflect the level of health service in the country, and for that reason these indicators are probably only meaningful for more developed countries. However that may be, the structural approach taken above to mortality may also be applied to morbidity, using morbidity rates instead of life expectancy in the calculation. Accidents in the home, at work, in the traffic may also be analyzed in this perspective to get at the structural component and not only the actor-oriented aspect - although the unit to which the accident applies would still be the individual human being.

If we then move on to "free to develop according to inner propensities and potentialities" there is, of course, a morbidity area located between outer and inner man; *mental illnesses*. These rates are among the most problematic but equally indispensable. The consumption of alcohol and drugs, to the extent that it impedes personal growth and does not serve to facilitate it under certain conditions, should also be included - particularly since there are such concepts as "alcoholics" and "drug-addicts" rendered unable to function properly by (almost) any standard.

So far all we have said deals with the negative approach to personal growth, with the factors impeding personal growth; here

the most obvious (death), via types of somatic and psychic diseases. What about the positive approach, to somatic as well as mental health? Centuries of research in the field do not seem to have led to much of a tradition in this field.¹⁸ This may be a positive sign, for if there were very specific norms as to what constitutes positive somatic and mental health then that would easily run against norms of diversity since it might lead to a uniform quest to live up to the standards. Still there is one type of approach that, although more structure-oriented than actor-oriented, should be mentioned. It touches on "inner man" in a very special way, but meaningful if personal growth is seen as the opposite not only of personal extinction, somatic death but also as the opposite of "alienation".

In starting with the "inner man" we start then in a sense with the most difficult value, for it is extremely difficult to conceptualize, let alone operationalize. It relates to the individual, yet should be comparable across individuals so that an average can be calculated for the collectivity as a whole. To many this may sound cynical, right out abusive, a travesty on the concept of personal growth. So let us try to indicate how the search for operationalization perhaps may also have the opposite implications.

Looking at four terms frequently used to give some connotation to what is meant by personal growth:

self-realization (connotation of fixed potential)

self-individuation (connotation of Western individualism)

self-expansion

self-actuation

we feel that only the last pair yields a basis for operationalization. Moreover, one key was found to be located between the actor- and structure-oriented perspectives, in the so-called allocation process.¹⁹ In short, are human beings made to fit into predetermined positions, in which case they have to be substitutable, replaceable; or are positions something to be built around irreplaceable *persons*? Can persons outgrow structure?

There are now two approaches available for the operationalization of substitutability, one in *extension* and one in *intension*.

The extensional approach is the easier one: simply find for

each individual in a collectivity how many could substitute him in his *work* relative to the total (work) population. Most persons are insubstitutable within the family (otherwise we would not call it a family), and often also in many other settings (among friends, in associations). But we focus on the most fundamental setting: the economically productive status. In some positions very many could substitute, in others very few - even down to zero if the person has overpowered completely the position. That lower limit is *insubstitutability*, and that is the precise version of the goal to be pursued, "personal growth", according to this perspective. *The average along the substitutability dimension would be the indicator we are looking for.* But we repeat that it is not very meaningful unless a dispersion measure is given. A high average may conceal a high level of alienation at the bottom.²⁰

Then there is the intensional approach, looking for the *number of characteristics* a person has to satisfy to fill a status, rather than for the *number of persons* who can be used to fill it. The more characteristics, in general, the lower the substitutability. The difficulty with this approach is that there is no upper limit defining insubstitutability, which is our positive value. Besides, it is both easier and more meaningful to count persons than to count "characteristics" - so we would generally opt in favor of the former.

(2) Diversity

This is also problematic, although perhaps less so than the preceding dimension. Basically, diversity has to do with *structural and cultural variation* found within a society. Leaving aside the cultural aspect, diversity has to do with the number of structural types found as an answer to a functional problem, *and* with the freedom of choice between them. As an example, take marriage. From one point of view, we can distinguish between four types: monogamous, the two polygamous types (polyandric and polygynic), and group marriage. From another angle one may distinguish between three types: heterosexual, and the two homosexual types. Combining these two typologies we would arrive at a maximum of twelve types.

Or, take educational systems. In principle we might distinguish between three types, using Margaret Mead's typology:²¹

post-, con-, or pre-figurative, depending on whether the flow of knowledge and insight is predominantly old-to-young, young-to-young, or young-to-old. Should we now simply count the number of different types and let that be the measure of diversity for that dimension? In that case, who is to decide whether the types are sufficiently different to be counted? And then there is the other aspect: how do we know that there is "freedom of choice"?

The only way of deciding and knowing, is to leave this to the *members of the collectivity* themselves. If, in fact, they choose different types, then that proves that free choice exists. In that case one measure of diversity would be the measure of "information" taken from information theory (p_i is the proportion choosing type i):

$$-\sum_{i=1}^{i=N} p_i \log_2 p_i$$

In addition there should be some measure of the degree of freedom for ideas and persons to move so that the choice is based on information and selection, and not something frozen into society by birth.²² However this is, diversity would be minimum, *zero*, if all members have concentrated on one type. In that case the other types would only be a theoretical *potential*, defined and expressed in the culture, not *actual*, empirical reality. It is the latter type of diversity this measure reflects; the diversity that exists and therefore may enrich people in that society - not the diversity that *may* exist. Correspondingly, diversity would be maximum, *unity*, if all p_i are equal, if the population were evenly divided between the types. In that case there would be maximum variation, minimum order, and uniformity. Thus, there is more diversity with a population evenly split between *two* types than in a society where the population is unevenly split between *ten* types. Whether this is reasonable is debatable; the whole measure is problematic.

The measure has the advantage of drawing our attention to an important circumstance. *No dictatorship is needed for the measure to attain minimum value: social uniformity can also be obtained through the mechanisms of democracy.* A compromise among several potential types, leading to the elimination of all but one type, is still *structural uniformity*, however much it takes place in a setting granting the freedom to express *cultural diversity*.²³

also after the compromise has been arrived at by majority vote.

A simpler measure would be based on the highest proportion, P_{\max} , which obviously can vary between 1 (uniformity) and $1/N$ (even distribution, maximum diversity). The measure would be

$$\frac{P_{\max} - 1/N}{1 - 1/N}$$

Like the other it measures the dispersion of *actors* on *structural* types.

Then there is the other aspect of diversity, *freedom to move*. This splits into free access to mobility for the body - transportation - and for the mind - communication, globally and domestically, outside and inside the country. And there is not only the freedom to receive but also to send information - freedom of assembly, of the press, of radio/TV. The simplest approach would probably be to count how many of these classical and important civil liberties are present - not counting the general availability and equality of access (to be discussed under (3) and (4) below).

(3) Socio-economic growth

Since this is the dimension that has dominated practically speaking all operationalization of "development", there is a very rich tradition to draw upon. We have chosen not so much to criticize or try to modify that tradition, as to incorporate it in the much wider framework of ten dimensions. The measures are incomplete rather than incorrect. If there is a value somehow available to the members of a collectivity, then it does make sense to divide that amount of value by the number of members to get some impression as to how much is essentially available, on the average, to the individual member. In other words, we recommend *arithmetic means* - of which *percentages* or *rates* are special cases - as the basic parameter for this dimension.

One distinction often blurred by all these averages, however, is that between *distributive* and *non-distributive* (collective) values: values that in a concrete sense can belong to an individual (like literacy), and values that belong to the collectivity (like a well). To apply per capita measures to non-distributive values in an individualization to fit a certain social cosmology,

where everything is distributed. It shades into the ridiculous when the number of kilometers of paved roads (or GNP for that matter) is divided by the size of the population. A supply of non-distributive value must be seen relative to demand, and demand should at least be expressed in terms of real users, consumers. The number of churches should be evaluated relative to the number of church-seekers, production of facilities for wigs relative to the incidence of baldness, and so on. To do this, more refined statistics will have to be made available, producing other denominators for these rates than the total population.

In our own research²⁵ we have found the following indicators of socio-economic growth particularly valuable:

1. *Satisfaction of fundamental needs*

- | | |
|--------------------|---|
| (1) food and water | F ₁ : Percentage with calorie intake not below age-, sex-, and place-specific minima, and average calorie-intake |
| | F ₂ : Percentage with protein-intake not below age-, sex-, and place-specific minima, and average protein-intake |
| | F ₃ : Correspondingly for water |
| (2) clothes | C ₁ : Percentage not below place-specific minimum, and average (e.g. cloth/capita) |
| (3) shelter | S: Percentage not below space-specific minimum, and average (e.g. rooms/capita) |
| (4) health | H ₁ : Infant survival (i.e. surviving 1st year) |
| | H ₂ : Life expectancy for males, and percentage above minimum |
| | H ₃ : Life expectancy for females, and percentage above minimum |
| (5) education | E ₀ : Percentage of literates in relevant population |
| | E ₁ : Percentage of age-group enrolled in primary education |
| | E ₂ : Percentage of age-group enrolled in secondary education |
| | E ₃ : Percentage of age-group in post-tertiary training |

II. Satisfaction of almost fundamental needs

- (6) transportation T_1 : Km² railroad-truck
 T_2 : Passenger-kilometers (per capita)
 T_3 : Tonkilometers (per capita)
- (7) communication C_1 : Mail/capita
 C_2 : Telephones/capita
- (8) Jobs J : employed/employable

III. Western growth

- (1) economic growth D_1 : GNP, GDP, NI
 D_2 : GNP/capita, GDP/capita, NI/capita
- (2) non-primary growth N_1 : Percentage of working population in non-primary sectors of economic activity
 N_2 : Percentage of economy derived from non-primary sectors of economic activity
- (3) industrialization I_1 : Industrialization: like N_1 , but only including secondary sector
 I_2 : Industrialization: like N_2 , but only including secondary sector
- (4) tertiarization Same indicators for the tertiary sector
- (5) urbanization U_1 : Percentage living in units of more than 20,000 (urbanization)
 U_2 : Percentage of living in units of more than 1,000,000 (metropolization)
 U_4 : Percentage living in units of more than 10,000,000 (megalopolization)

Then there are cars and roads, radios and movies, parks, libraries and so on - there is no limit to this list. And, indeed, there is the very problematic utilization of leisure.²⁶ But our focus is on classes I and II above, only they are clear indicators of development.

It should be pointed out that for the fundamental needs we have in most cases a double set of indicators: percentage of persons with the need satisfied, and average goal consumption. The distinction is basic and leads to different rankings,²⁷ for in an average the overdeveloped (e.g. the overtred) may cancel out and conceal the underdeveloped (e.g. the undertred).

In addition to these *growth indicators* there would also be the same number of *rates of growth indicators*. Since social systems are fairly inert, changing slowly relative to the capacity of human perception, there is the tradition of using change per year as a measure of the rate. This also applies to other than socio-economic growth indicators.

What one should warn very strongly against is the identification of any subset of socio-economic growth indicators with *social development*. Thus, we would define "social development" in terms of *all* ten goals, with the exception of personal growth, combining socio-economic growth and political growth. We would then see social development as a necessary (and sufficient?) condition for personal growth, much like Plato's just state, supposed to produce just persons. To reduce social development to a question of acreage of parks per inhabitant, or books on shelves in libraries, is to trivialize matters, to attempt to escape from politics into the safety of administrative routines, and even to overconform to an actor-oriented perspective of social affairs.

Equally strongly one should warn against the tendency to refer to "economic growth" as *economic development*. There is nothing wrong with the term "development"; but no matter how widespread the usage is, we are firmly against juxtaposing the terms "economic" and "development". Economic growth is only an aspect of one aspect of development; and it could even be contrasted with development, as has so often been done. As is well known there can be economic growth without diversity, without much social growth, without equality, without justice, with exploitation (inequity), with penetration, fragmentation, and marginalization - in short, growth without development.²⁸

Finally, what is here called "Western growth" is often referred to as "modernization". But it should *not* be referred to as "Westernization" - that term should be reserved for much deeper-lying aspects of social organization and be contrasted with, for instance, "Japanization" as a completely different way of becoming rich and modern.²⁹

(4) Equality

Obviously, the approach to indicators of equality would now be to develop *dispersion parameters*; zero, or low on dispersion,

meaning equality, high dispersion meaning inequality. For *distributed*, "private", goods this is relatively unproblematic as soon as the dispersion parameter has been chosen: the dispersion parameter will then measure the extent to which it has been distributed. For *non-distributed*, "public" goods, it should be defined in terms of *access to* (schools, hospitals), rather than in terms of *possession of* (education, longevity). Sometimes this would be measured in terms of *distance*, which in turn is a composite of kilometers, time, money and other types of cost needed to have access.³⁰

When it comes to parameters we would warn against standard deviation and variance, partly because they do not reflect empirical operations, only manipulation with numbers, and partly because too much weight is given to extreme cases. We might favor, for instance, the Gini coefficient, but there is also an argument in favor of percentile differences, and not only symmetric ones.³¹ In the future more parameters of equality and inequality will definitely be developed, so let us mention some general desiderata.

First, they should be a measure of the discrepancy between a potential reality of equality and an empirical reality of (varying degrees of) inequality.

Further, the model of equality should be in operational terms.

Thus, one model of equality when it comes to land reform is in terms of soil acreage (taking quality into account) - *equality simply meaning ownership of equal size*. Another model is in terms of power to decide over the use of land - *equality meaning equal sharing of decision-making*. In the first case acreage is distributed, in the second case not. Inequality can be defined by looking at the distribution of the size of the farms, for instance, with the top 10% of landowners controlling 50% of the land, the next 10% controlling 30%, and the last 80% controlling 20%. Or it can be defined in terms of power in decisionmaking over the use of the total amount of land available for tilling, probably leading to much more extreme types of inequality. For the *latifundista* not only controls his own sizeable part of land: he also - directly or indirectly - controls the *minifundistas*, making their share of acreage an upper limit for their share of control.

What the Gini index does is measure the area between the two Lorenz-curves of equality and inequality. The example is chosen to show how the parameter measures a form, the concrete content of which depends on how the variable is defined. The goal of equality would lead to two very different types of land-reform depending on which variable is chosen, size or power. In the first case, one would get the classical land-reform with land taken from the rich and given to the poor, decreasing the discrepancy between the curves of potential and empirical reality in land distribution. In the second case, one would get the modern type of land-reform where it is not land, but power over land, that is distributed, retaining the dimensions of the latifundios, even expanding them. Under the first condition, the goal would be to make each farmer a self-sufficient, autonomous owner of his own land (he who tills the land shall also own it); under the second condition, the goal might be large-scale industrial farming with each worker having an equal share in the decisionmaking under one of the many schemes of industrial democracy (he who tills the land shall also decide over it). Obviously, a transfer of power to a central bureaucracy would lead to neither the first nor to the second solution.

In conclusion, another approach to equality should be mentioned, since it is politically more important than reduction of the Gini index; a rather abstract, non-human measure anyhow. We are thinking of a systematic focus on the most deprived, on the bottom part of the population below the minimum on the indicators on fundamental human needs. In this approach economic development would be the extent to which fundamental needs (food, clothes, shelter, education and health) over and above the minima are satisfied. Instead of averages that conceal the dispersion, *and instead of dispersion that conceal the absolute state of affairs*, it is the proportion above the minimum level that counts as development. The indicators are given under (3) above; *conceptually they are measures of level as well as of dispersion.*³²

Essentially, this is one more human rights approach: an effort to measure the extent to which fundamental needs have been satisfied in the society *as a whole*, by focussing on the *lower* end of the distribution. Extended to employment, it becomes a matter of *right to work*. A shortcoming of the approach, however, is its failure to take into account the *upper* part of the distribution.

Thus, the question may be raised whether equality is possible in a society where all are literate, but there is no upper limit to education attained; or in a society where all are adequately fed, clad and sheltered, but with no upper limit on the consumption of such goods. For this aspect more general dispersion measures are needed, reflecting better the tails of the distribution, not to mention an ideology focussing on maxima, not only minima.

(5) Social justice

The approach to indicators of justice would be to develop *covariation parameters*, in order to study the extent to which being can be used to predict having. A low or zero value would mean social justice, a high value would mean injustice. If there is total equality - zero dispersion of having - then there cannot be any injustice, for there is no dispersion to be unjust with. But if there is a non-zero dispersion along the having variable, then it becomes highly meaningful to ask whether this is due to covariation with the being-having, or is independent of the being-variable. The latter is also a possibility: there can be inequality without any injustice; people may be poor or rich, but this may be unrelated to, e.g., their skin color. Hence, there is no doubt that social justice defined this way is a problem of covariation, and that it is logically distinct from equality.

The traditional approach to covariation takes as its point of departure the central tendency of one variable for each value of the other variable - i.e. the *regression curve*. In our formulation, this would generally be the average of having for each value of being. The simplest correlation measure possible would be some measure of the variation between the averages. If there are only two values of being - male-female, white-colored - the best measure would be the *percentage difference*, provided the averages are measured as percentages. Another measure would be the *generalized percentage difference* when there are more than two values,³³ or the steepness of the regression line fitted to the regression curve - i.e. the *regression coefficient*.

These are not correlation coefficients in the traditional sense, but correlation coefficients do not measure exactly what we are interested in. To the extent they are based on variance,

they are poor measures of inequality for the reasons given, although they do account for dispersion of having in terms of the variation in being. Justice is not primarily a question of equality, but a question of whether one group is, on the average, better off than another group, and this is reflected very well in the difference-between-averages approach we have advocated. When the difference is zero there is justice, according to this operationalization. When the difference is considerable there is injustice; and when the injustice is institutionalized, there is discrimination. And a negative difference or correlation, so-called compensatory justice, is only another form of injustice, however instrumental, even indispensable, in a certain phase.³⁴

It may be objected that this measure is too crude. It may be said that this is only the *first* approximation to justice, and that in the *second* approximation one should also require the two *dispersions* to be equal (in other words, "homoscedasticity"). Imagine the comparison is between two racial groups, and that the former underdog group has gained independence and has secured for a small minority of its members a very high level of having - so high that it has raised the average up to the level of the former dominant group, leaving the vast majority of that group way behind. Is this justice? In the sense of the operationalization, yes: but it also leads immediately to the idea that as a next step one might require equality between dispersions, as a third and fourth step equality between the skewness and "kurtosis" parameters, etc. until, ultimately, the two distributions have become equal.³⁵ But the latter is a very strong requirement, possibly even unnecessarily strong.

This general statistical approach has the merit of measuring *degrees* of justice and injustice. It does not rest content with a declaration that "there is justice" vs. "there is injustice" in the collectivity. On the other hand, too much emphasis on degree, on quantity, may lead the attention away from differences in quality. Thus, underlying this statistical approach is the implicit assumption that some individuals low on "being" may be rich on "having" and vice versa; that the correlation between the two is not perfect, not a "law".³⁶ In other words, there is some sort of assumption about upward and downward mobility, of drifting up and down. There is of course an implicit operationalization of *total social injustice*, viz., the condition of total separation

in two clusters - which may, or may not, be reflected in a maximum value of the covariation parameter. *But this condition is often the most important one, since this is the condition that really defines a society with first and second class citizenship, particularly when the separation is protected by concrete legal rules and institutions.* The indicator introduced is a way of detecting this type of condition, and also a way of measuring departures from it towards less unjust conditions. But it does not catch how strongly injustice is protected structurally.

As a special case under social justice comes *equality of opportunity*, to many a cornerstone in democracy.³⁷ We would operationalize it as any other case of social justice, using as having-dimensions "*having access to non-distributive value*", and as "being-dimensions" family background and geographical location. Whether equality of opportunity in fact leads to social justice in the broader sense, e.g. to justice in terms of occupations, is another matter that can be explored empirically precisely by means of these statistical tools.

This is where, in general, the justice approach is more satisfactory than the equality approach. Under the heading of equality all one can do is measure its degree of presence or absence. *The measures of inequality are non-structural*, they do not relate inequality to anything. Under justice, "having" is systematically related to "being", to any dimensions of "being", singly or in combination so as to find out which underlying dimensions would account for how much of the inequality encountered. This is basic; and empirical exploration in such terms should be encouraged to map the inequality and injustice, as long as this is not confused with tracing its institutional and structural causes. What we are saying here is only that the empirical operationalizations chosen are of such a kind that the whole variety of multivariate analysis techniques (MVA) would be at our disposal, thus following one of the guidelines mentioned in section 2 above.

One final advantage of social justice in terms of averages rather than dispersion is that averages are much more easy to come by, both for bureaucracies and for those trying to get information from bureaucracies. One should therefore require that statistics of "having" be systematically broken down on order-

gories of "being", e.g. that income, education, and health statistics be given separately for different districts, for the two sexes, for different occupations, different races or ethnical groups, and so on. In this way statistics on social justice vs. injustice would also give us information on the level of equality vs. inequality in the society studied. In short: *disaggregation*.³⁸

3. Operationalization of the structure-oriented goals

When it comes to operationalizing these goals there is less of a tradition available to guide us. Characteristically, social science is better at parametrizing distributions than structures. The measurement of society has been based on arithmetics rather than on geometry, because it has been based on the actor-oriented rather than the structure-oriented perspective. But that does not mean that the situation is impossible. Several of the values mentioned are relatively easily operationalized using the theory of graphs, converting into arithmetics, or even into statistical distributions, properties of geometrical structures. *The point is merely that the distribution will have to reflect a structure, not only properties of individual or collective actors.* For instance, take "equity", or the negation of exploitation: some kind of balance parameter is needed here, and this can never be defined in terms of one actor alone. At the very least a bilateral interaction relation is needed.

(6) Equity

Conceptually this dimension is not too problematic, but to narrow the richness of the concept down to something that can be operationalized looks difficult at present. Our point of departure would be the total cost-benefit budget when A and B are related to each other in an interaction relation.³⁹ The case of A and B being countries is easiest to handle:

Table 2. *The interaction budget: an example*

	A		B	
	cost	benefit	cost	benefit
Inter-actor effects:	REGULAR TERMS OF TRADE ANALYSIS			
Intra-actor effects:	pollution	spin-offs		little or none

What is needed is a focus on what takes place *between* as well as *within* the actors; a focus on *benefits* that accrue to them, as well as on their *costs*. For each actor the net benefit would then be calculated (it might well be negative, for one or even for both of them, as in a war), and the two net benefits then compared. The more equal they are, the more equitable the interaction relation. The average of the difference between the net benefits, for all bilateral interaction relations, would be a measure for a *set* of interaction relations, i.e. for a structure. This is the measure we are looking for.

Take the example of interaction between two nations exchanging raw materials for processed goods, alluded to in Table 2. Imagine that the exchange takes place at "market value" - they both agree that what crosses the borders in either direction has the same value. The basis for evaluating *equity* (not only terms of trade) is, however, broader: the interactor effects are included, and they can be positive (benefits) as well as negative (costs). For the industrialized nations the positive effects are the "spin-off" effects from processing, and the negative effects are usually summarized under the heading "pollution". For the non-industrialized nation the positive effects may perhaps be in terms of learning, but these are usually small, whereas the negative effects are considerable, in terms of depletion, erosion, etc. Extraction is easily status quo preserving, of structure. (All the time the reference is not to their economics as a whole, but to the parts affected by the exchange between them.)

One approach to operationalize all this would be in terms of *replacement value*,⁴⁰ asking for each *intra*-actor benefit "how much would we have to pay to obtain this without *inter*-action"; and for each *intra*-actor cost, "how much would we have to pay to undo this?" The difficulty with these measures lies in the circular reasoning they may lead to: market prices are somehow accepted as a basis for measurements, and these prices are themselves expressions of an equitable structure. However, as a first approximation this may be useful, and such calculations should be carried out.

As another example take the interaction between a worker and manager, with the former selling manpower for salary, but performing highly confined work because his position is high on

substitutability. For the worker the job is personality-contracting, for the manager it may be personality-expanding. These factors are more difficult to monetize, but it does make some sense to ask how much the director would have had to pay for similar experience and challenge, or the worker needed to compensate for the psychological (not to mention the physical) losses incurred during long and tedious working-hours, -days, -years. Again, operationalization may be difficult - but not impossible - and it would be clearly practice-indicative in either case.

All that has been said so far gives at best only an operationalization of equity in economic interaction. But the example of the director and the worker points further, and the same basic logic can be used for any type of interaction.⁴¹ The fundamental question would be in terms of intra-actor costs and benefits, not only inter-actor effects of the interaction. The next question, in an effort to operationalize, would be in terms of what it would "cost" to obtain these benefits if the interaction had not taken place; or to negate the costs when the interaction does take place.

To return to the example involving two countries trading with each other: *degree of processing* is a fundamental variable here, since processing entails positive and negative spin-off effects. If we now assume that degree of processing *is* important, then a simple measure of division of labor can be developed, although it is far from unproblematic. Let us refer to "degree of processing" as D; assume it varies from 0 (pure extraction) to 1 (pure form); and study export, E, and import, I, as a function of D. Thus E (D) would give us for a country the value of the export for each level of degree of processing, and similarly for I (D). The quantity

$$\int_0^1 E(D)dD - \int_0^1 I(D)dD$$

is simply the trade balance and says nothing new. The difference between the averages of these distributions is better, since it tells us, on the average, whether export or import is higher in processing. But since D is not operationalized we have to split

it in a two-point manner:

$$\text{For export: } I(D=0), \int_{>0}^1 I(D)dD$$

$$\text{For import: } I(D=0), \int_{>0}^1 I(D)dD$$

This may become much more meaningful, since we now give the value of raw material export and import, and the value of processed goods export and import. Such a distribution can be obtained by using the SITC code, possibly leaving out a vast in-between category of semi-processed goods.

Let us symbolize these values as follows:

	Raw materials	Processed goods
Import	a	c
Export	b	d

Some countries tend to trade along the main diagonal, some countries along the bi-diagonal in this matrix; and then there are countries with no clear configuration.

Obviously, a + d measures the extent to which the country is a processing country, b + c the extent to which it is an extracting country. The measure⁴²

$$TCI = \frac{a+d - (b+c)}{a+b + c+d}$$

or the *trade composition index* is a measure of where on the axis from -1 (pure extracting country) to +1 (pure processing country) the country is located. The measure is admittedly crude because it only allows for a simple dichotomy along the D axis. However, it is still meaningful, for it distributes the countries on a major axis of world trade politics. In fact, the traditional Yule's 0 correlation coefficient, treating the distribution of the total trade as if it were a frequency table (and in a sense it is, counting monetary units), i.e.

$$Q = \frac{ad - bc}{ad + bc}$$

gives a better dispersion. In either case Japan comes out on top, and then follow the Western industrialized countries. At the bottom we find a heavy cluster of "developing" countries.

This measure, in additive as well as multiplicative form, indicates the position of a given country in today's *world vertical division of labor* as far as trade is concerned. It is a relational measure and does not reflect the total economy of the country, but how it is placed in the exchange system - and that is what we wanted.

The measures could now be calculated on the basis of world trade, regional trade or dyads, i.e. pairs of countries. Obviously, if the trade between two countries is considered, the algebraic values for the two countries will be equal since what is export for one is import for the other. But whatever the basis, the distance between them, and the generalized distance (the average of the absolute distances for all pairs), or any other measure of dispersion along the TCI axis would be a measure of the "total degree of division of labor" in a group of countries. We do not say "total degree of inequity", or "exploitation", since the relation between division of labor and exploitation/inequity as indicated above is a complex one, and these are obviously only measures of division of labor.

The complexity hinges on the definition of "degree of processing", D itself. We define D as the degree of imprint of culture on nature, *culture being defined as pure non-material form* (like a piece of mathematics, a symphony); nature being defined as zero processing. Form is matter reduced to zero, form being the essence of the "product".

How, then, does one define degree of processing, given these considerations? Here are four attempts:

(a) *On the basis of capital*,⁴³ relating the price of the processed product to the price of the raw materials that went into producing it. The difficulty is that any such measure builds into the analysis the structure of the market with all its potential implications.⁴⁴

(b) *On the basis of labor*,⁴⁵ relating the work that went into the processed product to the work that went into the raw materials.

The difficulty is that any such measure depends heavily on fluctuations in technology, on how easily available the raw materials are, and so on.

(c) *On the basis of protection*,⁴⁶ studying the amount of protection of various types (tariff barriers, non-tariff barriers) given to products at various levels of processing. Typically, the tariffs for raw materials are zero, for semi-processed goods 5-10%, for more processed goods 10-20% and so on.⁴⁷ Non-tariff barriers may be more difficult to estimate in precise terms, but hardly impossible, looking at the empirical effects of quotas, all kinds of standards, etc. If one considered only tariff barriers (now yielding to the non-tariff barriers) then the assumption would be that those who have decided on the tariffs knew what they did so that if the duties levied on two products are 10% and 15% respectively, then the degrees of processing relate to each other as 2:3. The problem is, however, that these barriers change in space and time even when degree of processing cannot otherwise be said to change, and that they reflect the relative power of nations and groups of nations.

(d) *On the basis of information theory*.⁴⁸ If processing is giving form to nature, then it should be possible to develop a measure of the degree of form, using the information theory notion of the number of dichotomous choices that went into producing that particular product, given the raw material. In a sense this would be the ideal measure - but not easily available.

There is also a fifth approach: to try to relate degree of processing to the spin-off effects, simply stating that the effects are proportionate to the degree of processing. However, this leads to the difficulty that any proposition about a relation between degree of processing and spin-off would be a tautology, although a very simple one, not the highly complex semi-circular relations the first degree measures above would lead to. Hence, there seems to be no way out except to try to develop a measure along the lines suggested in (d) above.

(7) Autonomy

Autonomy is for the power aspect of the interaction relation what equity is for the exchange aspect - which means that the two are closely related. Autonomy is power-over-oneself so as to withstand what others might have of power-over-others. If we make use of the distinction between ideological, remunerative, and punitive power; then assume that these work only under the condition of a certain submissiveness, dependency and fear; and that the antidotes are *self-respect*, *self-sufficiency* and *fearlessness*, respectively, then these "antidotes" form the three components of autonomy as we see it.

The first component, *self-respect*, has to do with goal production, which, in turn, is a part of cultural production. The problem is the extent to which this production is indigenous and not based mainly on cultural import. When the Chinese alleged that the "social imperialism" of the Soviet Union was a threat to their autonomy, what they expressed was the strong feeling that explicit and implicit goals were impressed upon them (e.g. Model II society, as opposed to Model III society). The same can perhaps be said about Eastern Europe today, where essentially Western European goals are pursued, only at a higher level of state ownership.

Does that mean that *cultural diversity* is an indicator of identity? No; if the culture, including the goals, is similar to other cultures this is no proof of submissiveness. It could also be the result of genuine discussion and a conscious decision to accept those goals. Further, diversity in the form of acceptance of old culture, of ancient indigenous culture as an alternative to cultural pressure from the outside, is not proof of autonomy either: it may just mean submissiveness to earlier generations rather than submissiveness to other, contemporary cultures. Cultural colonization can take place in time as well as in space.⁴⁹

Hence, the indicator would probably have to be the extent to which present *cultural production* is carried out elsewhere, and takes the form of import of books (relative to local production), of foreign authors (relative to local), of foreign import in school and university curricula (relative to locally produced curricula), etc. This is not satisfactory as an indicator, but it is probably better than nothing, and certainly better than cultural diversity.

As to the second component, *self-sufficiency*, there is an old tradition: the proportion of the GNP (or some similar indicator) that is not trade-dependent. Thus, the present superpowers - USA, the Soviet Union, China - are on the top of this list (but not the EC and Japan), and this is no doubt related to their autonomy. The measure can be used as long as one remembers that it is overly quantitative and does not take into account the fact that the country may depend qualitatively on some very few imported items, e.g. energy. On the other hand, if these items are cut out (during a war, for instance) the country may show

great powers of endurance, of improvisation, of mobilizing untapped resources, and the items may prove to be less important than originally considered. Hence, it is really only after a crisis, an *experimentum crucis*, that the degree of self-sufficiency can be known, since one crucial factor is the population's ability to accept a decrease in living standard in addition to improvisation.

As to the third component, *fearlessness*, we would again have to proceed in a roundabout fashion, and try to measure the level of *invulnerability*, which would be the objective counterpart of fear. In one sense, a "traditional" and a "modern" society relate to each other like primitive and more advanced organisms. A traditional society would typically consist of many parts, e.g. villages, themselves largely self-sufficient. The "modern" society has a center and periphery, and the two are highly interconnected so that the periphery will have greater difficulty surviving without the center, and vice versa. Destruction of a part of a traditional society, in war or in a natural catastrophe, may lead to spontaneous regeneration (as in a "primitive" organism) since each part is like the others, and the others can continue more or less as before.⁵⁰ The destruction of the center of modern society may lead to total social destruction because of the high level of *interconnectedness*, *division of labor* and *centralization*. For that reason "modern" society will try to protect itself by making itself less vulnerable to attack. In doing that it would have to attack exactly the three factors mentioned above to bring about a *more decentralized* society, where the various districts are *less interconnected* (so that destruction of one does not destroy the rest), and with *less division of labor*. This might mean that the less vulnerable society is both more like the traditional society and our preferred society⁵¹ - and that modern society is an aberration because of a vulnerability so high that modern arms races are seen as the only answer.

The operationalization of invulnerability - the objective aspect of fearlessness - would then be based on an analysis of the degree of centralization, interconnectedness and division of labor. It would be possible to express this as a one-dimensional indicator, but possibly only by means of panels of well-instructed judges asked to rate societies on, e.g. a five-point scale ranging between these two extremes.

(8) Solidarity

Solidarity as here conceived of is considerably easier to operationalize. Again, all that can be hoped for in the first run is to operationalize the objective aspect, not subjective feelings of solidarity. It concerns the interaction *pattern*, not actor attitudes, and only the *bilateral* relations, not the multilateral relations.

Solidarity is defined as the degree of togetherness *at the bottom* of the social structure. In order to talk about solidarity one first has to know the division of labor: who exploits and who are exploited, who are on top, who at the bottom. Togetherness at the top is seen as one aspect of structural power, another aspect being fragmentation at the bottom. Hence, solidarity is the extent to which there is no difference in togetherness at the top and at the bottom. It is not enough to say that there *is* bilateral interaction at the bottom; it has to be commensurate with the corresponding indicators at the top. If it is, if workers associate as much as directors, and poor countries as much as rich countries, etc., then solidarity has been realized; there is a certain balance in the structure. There has been a transition from a feudal structure to a class structure, not only with class consciousness (which would be the subjective aspect of solidarity), but also with class mobilization. In addition there may be some topdog sympathy with the underdog, but that is not a structure.

One approach to the operationalization of solidarity would be to calculate, for each position in the interaction structure, the so-called *associated number* - the *maximum number of bilateral steps* (i.e. interaction relations) one would have to take from that position to the position furthest away.⁵² Another approach would be to calculate the *average number of steps* to all other positions, in order not to give too much weight to long "tails" stretching out to distant positions. Thus, in the simple three-actor structure where one center actor rules over two fragmented periphery actors, the associated number for the center is clearly 1, while for the periphery it is 2. In general, the positions with *minimum* associated number are referred to as the *center* and the positions with *maximum* associated number as the *periphery* of the structure. Correspondingly, for the average number of steps:

one would talk of minimum and maximum *ranges* rather than *numbers*.

The next step would then be to look at the distribution of associated numbers or averages. This distribution also has an average which is a crude measure for how far, on the average, one has to go in that structure to reach the position most removed. The lower the average, the more connected the structure and the more direct the relationship; the higher the average, the less connected and the more indirect the relationship. Thus, the magnitude of this average can be related to the problem of indirect vs. direct democracy.

That distribution also has a dispersion, and this is what we are looking for. In this case we would not object too strongly to variance-based measures of the dispersion. Regardless of how the dispersion is measured: the higher the dispersion, the more asymmetric, and the lower the dispersion, the more symmetric the structure - down to zero, where the structure would be completely symmetric. In this case all positions would have the same maximum (or average) distance to other positions, so that they are equal where access to each other is concerned. There is no longer any center or periphery in *this* sense, hence no longer any fragmentation. Whether that distance is short or long is another matter; that depends on how saturated the structure is.

The weakness of this measure is that any interaction relation, weak or strong, is counted equally. The measure is binary; a relation exists or it does not. But there are other operationalizations that would reflect both structure of interaction and quantity of interaction. Thus, consider the total export from a country or from a group of countries, and study the distribution of the percentages of the export in various directions; p_1, p_2, p_n . From this distribution several measures can easily be derived.

The first measure, *export concentration*,⁵³ would be based on the ordering of the p_i according to magnitude. The largest p_i , or the sum of the three largest, would be the measure. If it is very high, export is evidently going to only one, or three countries. This means that it is highly concentrated, which in turn means that the country in question is some kind of appendix to these countries. However, it does not necessarily follow that

the country is alone in this: it might be that all countries had very high levels of export concentration. For that reason the distribution of export concentration measures should be studied, and standard scores computed. Another term instead of "export concentration" might actually be "export vulnerability", since it is reasonable to assume that the higher the concentration, the more vulnerable the export.

The second measure, the *Eigenhandelsquote*,⁵⁴ is based on adding trade figures rather than ordering them. Groups of countries are defined, e.g. as MDCs and LDCs, or by region. The *Eigenhandelsquote* would be the percentage the export *inside* one's own group comprises of the *total* export from the countries in the group. It is a measure of the tendency to export to one's own kind. Characteristic of countries at the bottom of the world system is not only that they trade less in total, but also that they trade less among themselves. Whereas export concentration measures the degree of concentration upwards, the *Eigenhandelsquote* measures the degree of fragmentation sideways, at the bottom. Just as for the export concentration it is the relative *Eigenhandelsquote* that gives the best image of the level of solidarity or fragmentation.

Similar figures could then be calculated for the *import* or for the *total trade*, which would be the sum of the two (or the average). The measures are meaningful not only for goods or other economic entities, but also for other types of interaction, such as the movement of persons and information.

(9) Participation

The interaction structure consists of relations and patterns, and participation is to the multilateral interaction pattern what solidarity is to the bilateral interaction relation. Solidarity connects the periphery and makes for a more symmetric structure; participation brings the marginals, whether due to exploitation or isolation, into the patterns and makes them more generally participatory. A fragmented structure makes actors into appendices; a marginalized structure cuts them out from multilateral participation. The two concepts are logically independent; although there is often a high correlation between being peripheral and marginal they refer to different aspects of the total structure.

Essentially, marginalization is the division into first and second class members.

The simplest way of measuring participation would be by counting participation in organizations, even in the form of counting membership cards (including credit cards and party cards). There are two difficulties, however. Organizations are *institutionalized* multilateral interaction. The crowd, the clique, the network may be much more important as ways of counteracting marginality - which means that the type of data collected by anthropologists and sociologists would also be needed for operationalization. Second, there are so many organizations that in their very structure are the exact opposite of what here has been referred to as "development" (because of heavy division of labor), which means that participation as here defined is only a limited segment of the total process. It is nevertheless included as a separate dimension, particularly since the distribution of number of membership in an organization is usually extremely biased. Integration at the top of society is a question not only for more bilateral interaction, but also of more memberships - to the point where society may become a real dichotomy between a saturated, participant network on the top and a second-class group of peripherals and marginals.⁵⁵

(10) Ecological balance

Finally some words about the relation to nature although it is not a "structure-oriented goal". All we can do here is to give some comments from a social science perspective as to the direction in which we might like to see "ecological balance" operationalized.⁵⁶

"Ecology" refers to something in which man is included, it is not a Man *vs.* Nature, nor a Man *in* Nature, but a Man-*and*-Nature concept - human beings as a part of nature. It may be argued that only biological man as part of the biosphere is included, but the concept opens for considerations not only of *over-pollution* and *over-depletion*, but also of *over-population*. Moreover, it considers not only whether Nature is adequate for Man, but also whether Man is adequate for himself and Nature - and Nature's adequacy for Nature.⁵⁷

Second, equilibrium or "balance" refers not to a stationary state but to a moving equilibrium. Certain variables change, such as all the other nine goal-dimensions. Others do not change,

or do so only within a limited band. Perhaps the study of ecological balance is the study of the conditions for maintaining a stable equilibrium, i.e. a range protected by some reinforcement mechanisms.⁵⁸ For a human body to be healthy where temperature, blood pH, or blood sugar are concerned it is not to maintain constant values but to have control mechanisms that keep the values within a certain range; and correspondingly for ecological indicators. Some of these control mechanisms will be man-made, e.g. recycling and population control.

These two comments have some generally recognized implications as to the most common approach to indicators in this field, the *critical value* approach, the *danger signal*.⁵⁹ The *homo mensura* thesis ("man is the measure of all things") must not be interpreted to mean that "critical" is only "critical to man". Much is known today of the complex cycles in the man-nature system to locate critical values on variables not only from an anthropocentric viewpoint, but also from the view of the total eco-system, of the total ability of the man-and-nature to reconstitute itself.

Second, deeper insight should also lead to insight in deeper-lying variables. Instead of a bundle of pollution/depletion/population variables on which critical limits may be fixed, on the basis of how they are related to each other rather than on a one-variable-at-the-time basis, it is necessary to identify and operationalize some variables that come closer to the generalization mechanisms themselves. Of the goals discussed above, "equity" may be said to be a variable of that kind, one that brings much in its wake once it has been conceptualized and to some extent also operationalized. Similar variables are needed for eco-systems. Thermal pollution might, perhaps, be one such variable.

To understand the political geography of depletion/pollution, however, the distance to the critical limit has to be related to geographical coordinates, and the part a country has of world depletion and pollution has to be related to the part it has of world population.

Thus, it would be hoped that the immense research effort in this field will also soon lead to theory-based indicators that reflect a more complex view of man-and-nature and at the same time are intuitively reasonable and comprehensive.

4. *Towards world social indicators*

Let us now return to the introductory section, to the four levels of discourse, to the image of the world as consisting of nature, individuals, and collectivities, with the latter divided into territorial and non-territorial. The good world is the world offering good life to us human beings on our setting - it is not an abstraction fulfilling some kind of formula. Only at the level of the individual can social goals be validated. A rich society is not a higher form of social life than a poor, or a socialist society higher than a capitalist one, unless life is somehow better for *people*. That does not mean that the good life can only be conceived of at the level of the individual. Equity is a part of the good life as here defined. It is an autotelic goal, not a means to obtain something, and it cannot be defined at the individual level. Nor does our concept mean that efforts to measure how far a given collectivity has come in providing good quality of life for its citizens are meaningless - on the contrary, such measurement is even mandatory.

If we now look at the levels defined in the introduction it is clear that we run into a problem, the "problem of levels", when it comes to conceiving of the good *world*. The problem appears when one proceeds level by level. Thus, at

Level 0: the focus is on *ecological balance*;

Level 1: the focus is on *individual* being (personal growth) and *individual* having; all the others are meaningless at this level;

Level 2: the focus is on average being and having, on dispersion of being and having, on social justice, equity, autonomy, solidarity, participation inside the *collectivity*.

So far there is no problem. Individuals can be viewed in terms of enrichment and accumulation, what they are and what they have. Collectivities can be viewed as sums of individual being and having - the latter would also bring in collective goods - and then there are all the other distribution and structure variables. They apply to territorial as well as to non-territorial collectivities, although we are most accustomed to applying them to the former.

But at the third level we have a choice between three approaches.

First, we can view the world as one big collectivity, soon with four billion inhabitants. In one sense this is the perspective that should be used as often as possible, since it is the only perspective that clearly sees the human being as the basic unit. Questions about the world level of fundamental need satisfaction can only be answered using this perspective.

Or, we can view the world as a collectivity of collectivities, particularly of countries. Here there are again two possibilities, depending on the kind of data used for the countries:

- data derived from the *intra-societal level*, where "personal growth" would be average individual personal growth, accumulation would be everything accessible to individuals, equality would be average equality, autonomy average individual autonomy, and so on.
- data derived from the *inter-societal level*, where "personal growth" would be the "national growth", diversity would be between nations (and not an average of the diversity within nations), equality would be between countries and not an average within them, all the structural variables would be between countries, not averages within, and so on.

Actually the first of these two, the *comparison* of collectivities, is best served not by calculating sums or averages but simply by the standard procedure of establishing lists, e.g. with countries in alphabetical order, giving the social indicators for each country. *But this is not the same as world social indicators*; that purpose is only served by viewing the world as a collectivity (not only a set) of individuals or countries, studying the distributions and structures of this our world. And it is at this level that the *war system* can best be understood and described in its totality, not only as a comparison of the propensity of countries to engage in belligerence.⁶¹

There is no way of combining these three different approaches. They are not mutually reducible, nor is there any reason why they should be. They simply express three very different and profound perspectives: the world as a community of persons, the world as a set of countries, the world as a community of countries. All three perspectives are valid, depending on context and purpose.

This concludes our review of indicators. No doubt very much work has to be done in this field, but it is wrong to assume that the bottleneck lies in the construction of available indicators. *The indicators largely exist already; the problem is the*

willingness to use them. Out of the total variety of possibilities that we have tried to present here, only some of the indicators of socio-economic growth, and particularly of economic growth, are in widespread use - because they are compatible with the actor-oriented view of society, with a capitalistic economy, because they place the most powerful nations high on the indicators, and because they conceal almost completely everything that has to do with politics, i.e. with conflicts of goals and interests. Thus, not even simple indicators of how many have fundamental needs satisfied are in widespread use.

For that reason people should demand from all governments statistics that reveal deeper aspects of the societies, and particularly aspects that relate directly to man, to the individual human being, and particularly to the most deprived - not only to national averages. We should not be fooled into believe in that what is often referred to as "social development" or "social indicators" is a substitute for this. More often than not it is merely a subset of the indicators of socio-economic growth, and does not touch social structure at all.

Since inter-governmental organizations reflect governmental interests it should not generally be expected that they would take any lead in these matters.⁶² On the contrary: it may well be that not only the publication, but even the collection of this type of data in a systematic way and easily available would have to be the task of non-governmental organizations, within and between nations. And in this question there is tremendous variation from one nation to another and from one organization to another - just as there is from one social scientist to the other.

NOTES

x) This is a revised version of a paper with a long history. It is an outcome of the author's work within the World Order Models Project, and appears as an appendix in *The True Worlds: A Trans-National Perspective*. Originally presented at a conference on social indicators in Madrid, Spain in July 1969 it went through successive stages and was discussed at the University of Zürich (where I am particularly grateful for comments from Professors Peter Heintz and Bruno Fritsch) and as a plenary lecture at the Nordic Sociological Conference, Copenhagen, June 1972. I am also very grateful to all my friends and colleagues in the World Order Models Project for helpful comments and criticism in the various stages of the paper.

1) It is doubtful whether any major intergovernmental organization, including the UN and all UN specialized agencies and the governments in bigger and richer countries, including many of the specialized ministries, can be found today that does not have some kind of indicators program.

2) In saying so it should also be emphasized that when indicators are developed by bureaucracies, governmental or intergovernmental, there is a tendency to concentrate on means (e.g. enrollment ratios, "schooling") rather than goals (education).

3) Somebody should one day write up the excellent public relation work that must have been done by these experts in making that indicator so dominant in the world. There seems to be much to learn!

4) In this way it produces the familiar image of the world today: a small number of countries high on all development indicators, and a vast number of countries low on all or most development indicators. It is high time that indicators are found that can give a more realistic image of the world by introducing other variables.

5) It will be evident that by "political left" is meant something relatively precise: a structure-oriented perspective, as opposed to the actor-oriented perspective more prevalent in the political right and middle.

6) It should be emphasized that for this to happen it is not enough to carry out public opinion polls or informal interviews. These are methods of estimating current public opinion, more or less valid, but no substitute for a real dialogue in society at large about goals. Thus, although the data presented in for instance *Images of the World in the Year 2000* (Omauer, Sicinski, Wiberg, Galtung, eds.: Mouton, 1974) are interesting and important, they are only a little step on the road towards some more democratic perspective on indicators.

7) For a theory of units and variables at the various levels, see Johan Galtung, *Theory and Methods of Social Research* (Oslo, London, New York, 1967), part 1, chapters 2 and 3.

- 8) Most important examples have to do with such words as "socialist", "democracy", "developed" - where we now very well know that institutional changes in the sense of collectivization of the means of production with collective planning, free elections in a competitive political system with a presidential or parliamentary democracy; and the introduction of a number of aspects of Western modernization do not necessarily lead to societies in which it is good for people to live.
- 9) The book referred to in the introductory note, *The True Worlds: A Trans-Rational Perspective*, particularly chapter 3, is an effort in this direction.
- 10) This is developed at some length in *op.cit.*, chapter 3.
- 11) It should be emphasized that this distinction is not so sharp: for instance, *is* a person healthy, or does the person *have* health?
- 12) This is developed in *op.cit.*, chapter 3. The important thing about work in indicators, however, is that it forces a certain preciseness on the analyst, for good and for bad.
- 13) Rank disequilibrium is the condition that obtains when one actor is high on one dimension and low on the other, for instance well educated, but poor.
- 14) Rank incongruence is the condition that obtains when two persons have opposite disequilibrated profiles, so that in addition to the persons mentioned in the preceding footnote there is also one who is low on education and high on income. For a further development of these concepts, see Johan Galtung, "Rank and social integration: a multi-dimensional approach, in Berger, Zelditch, Anderson: *Sociological Theories in Progress* (Boston: Houghton Mifflin Co., 1966).
- 15) This is developed at some length in Johan Galtung, "On the relationship between human resources and development: Theory, methods, data", in Nancy Easter, ed., *Measuring Development: The role and adequacy of development indicators* (London: Cass, 1972), pp. 137-54.
- 16) This is developed in Johan Galtung, *Methodology and Ideology*, ch. 4.
- 17) See Johan Galtung and Torodd Høivik, "Structural and direct violence: A note on operationalization", *Journal of Peace Research*, 1971, pp. 73-76.
- 18) The only exception that one might like to mention from recent American psychology would be Abraham Maslow, particularly his important book, *Towards a Psychology of Being*.
- 19) The allocation process is any process whereby people are somehow placed into the various positions in the social structure, whether it is by free choice, by ascribed characteristic, or achieved characteristic. This is of course a basic aspect of alienation: the lower one is in society, the more substitutable one is. It is mainly at the top of society that one is in a position to create one's own position, so as to be insubstitutable, and thereby in a certain very special sense "immortal".

- 20) All public opinion studies we know about work satisfaction etc. tend to show considerable correlation with social position: the lower one is located, the less meaningful and satisfactory most aspects of life. It does not seem to be true, generally speaking, that industrialized societies also have a happy-go-lucky extreme periphery at the bottom.
- 21) This typology could never have been developed by a marxist social scientist to whom age categories appear as almost irrelevant. It is characteristic that they stem from a leading anthropologist particularly famous for her studies of the impact of "modern" ideas, artefacts and structures on "traditional" (meaning stable) societies - more or less reversing the entire learning process in society.
- 22) The question is of course whether this choice is really free, or manipulated, or even forced upon people. For this reason it should be very strongly emphasized that pluralism is a possibility, an option, not prescribed. It includes the possibility of staying put.
- 23) This distinction is basic in the author's "Structural pluralism and the future of human society", in *Proceedings from the Second International Future Research Conference* (Tokyo: Kodansha, 1971).
- 24) It can of course be objected that this measure puts too much emphasis on the highest proportion.
- 25) Thus, in the studies on Japan quoted in footnote 15 above, these indicators have been made use of.
- 26) Thus, it is not even completely clear whether leisure is good or bad - there can be too much of it and too little of it, but what is *quantum satis*?
- 27) Thus, the ranking position of the United States would differ considerably depending on which indicator one makes use of.
- 28) The typical example so often quoted would be Liberia, the Republic of Korea, and Iran. Many others could be mentioned, one of them being Brazil.
- 29) For one effort to formulate the typical aspects of "Japanization", see the author's "Social structure, education structure and life-long education: The case of Japan", in *Reviews of National Policies for Education: Japan* (Paris: OECD, 1971), pp. 131-52.
- 30) To our knowledge nobody has so far worked out a good indicator of this.
- 31) Thus, in the study *Educational Growth and Educational Disparity* by Galtung, Beck and Jaastad, indicators like P₉₅-P₅₀ and P₉₀-P₅₀ were made use of for education, measuring the distance in schooling between the top elite and the bottom masses. Symmetric percentile differences, like the classical P₇₅-P₂₅, would not capture social reality so well - although it actually yielded the same general result.
- 32) Needless to say, this approach to the operationalization of development may put countries high on averages much further down the list because the approach focuses on what happens at the

bottom, not on what happens at the top or to the average. It is also obvious that such indicators will tend to be resented by establishment social scientists from such countries. As once expressed informally in a UNESCO conference on indicators (December 1972): "You see, we are used to an indicator being something that puts the US at the top and Gabon at the bottom ---".

33) This measure is developed in Johan Galtung, *Theory and Methods of Social Research*, 11- 5.

34) The argument is translated into policy in connection with the *harijans* in India, and the experiences gained might be important for similar practices in connection with the fight for increased female participation in politics.

35) By means of such techniques as use of the Gram-Charlier series.

36) Classical Hindu caste societies are usually considered good examples of "law" of this kind: what a person is (caste, by birth) determines a very wide range of what he is going to have.

37) Historically this will perhaps stand out as a stepping stone in the history of liberalism towards the welfare state: from the conservative idea of an essentially frozen society determined by birth via the social darwinism of survival of the fittest to a gradually more tamed society, first through equality of opportunity (so that the competition for social position is "fair"), then the welfare state ideas that guarantee a certain minimum level of living. Socialism, however, is still far away - it would include notions of real equality, of ceilings, not only floors, and of new patterns of division of labor.

38) This is usually required of statistics today, but also has its dangers because the disaggregation can be in less important directions. Thus, disaggregation is usually given in terms of districts (because this is the basis for collecting statistics); much more important is disaggregation on the basis of class, race, sex, so that an image can be made of what role social position is permitted to play in, for instance, mortality and morbidity. Knowing this one might start developing measures of structural violence - see the article by Galtung, J. and Myrnes, T. on this in *Journal of Peace Research*, no. 1, 1971.

39) See Galtung, Johan, "A Structural Theory of Imperialism", *Journal of Peace Research*, 1971.

40) This approach is used by economists in the effort to calculate the costs of pollution. Simply stated, how much would it cost to undo the pollution, or at least the damages it causes.

41) The general approach, hence, is to ask what value is generated internally by the actors in interaction, due to the interaction itself - for instance in terms of experience, learning that otherwise would not take place, etc. The approach presupposes a clear value perspective and data on positive as well as negative effects along the value-dimensions in order to compare the net benefits.

42) See Appendix, article referred to in note 39. Ymut Bonqval contributed important ideas in this connection.

- 43) This is the approach found in liberal economics.
- 44) And the most important aspect is the power dimension: some are in a better position to fix prices than others. We cannot use a measure that is determined by the relations of the market to study the market, that only brings us into a *circulus vitiosus*.
- 45) This is the approach generally found in marxist economics.
- 46) For a very good study of this, see Antonin Wagner, *EWG und Dritte Welt*, Fribourg, 1971.
- 47) A fruitful thought experiment would be to imagine the tariffs reversed, with higher tariffs for unprocessed than for processed goods - virtually discriminating against countries that do not process their raw materials themselves.
- 48) I am indebted to Karl Deutsch for this suggestion.
- 49) For this reason the task of future studies is to open the future by exploring more and more options and urging policies that increase the range of future options.
- 50) One case here seems to be the terrible flood disaster that hit parts of the present Bangladesh (in the Ganges delta), December 1970.
- 51) This society is defined in terms of the ten value-dimensions used here. When it comes to concrete implementation and images they offer enormous scope for variation - as they should.
- 52) This approach is developed by Nils Petter Gleditsch and Tord Høivik in "Structural Parameters of Graphs: a Theoretical Investigation", *Quality and Quantity*, IV, 1970, No. 1, pp. 193-209.
- 53) This is a standard measure, but there is the problem of how to measure amount of export because of the weakness of any "market" based measure. If a country exports raw materials in one direction and processed goods in another, and raw materials are consistently undervalued, the measure may become very misleading.
- 54) See Wagner, *op.cit.*, pp.
- 55) It will be noted that there is a rather clear value basis in what we are saying: when there is integration at the top it is referred to as marginalization of the bottom: when there is integration at the bottom it is referred to as solidarity. This asymmetry, of course, derives from the tremendous asymmetry in the present world: a "value-neutral" perspective on these matters would, in fact, be value-loaded because it would accept status quo.
- 56) One thing is certain: we shall not rest content with simple measures of pollution and depletion rates: it has to be referred to something.
- 57) This is important: it is much too often assumed that Nature exists for Man's sake and not for and by itself; moreover, it is also assumed that Nature when left to itself is harmonious, in balance. We would agree that Man has not only a right but a duty to intervene and establish or restore balance, even when Man is not directly concerned.

- 58) This points in the direction of a stable equilibrium, but a stable equilibrium that is dynamic, not static.
- 59) This, of course, presupposes relatively clear ideas about pollution ceilings and depletion floors - the former possibly more easily established than the latter because human physiology is involved; but the latter supported by stronger social forces under private and state capitalism.
- 60) This is just general methodology; see, for instance, *Theory and Methods of Social Research*, I, 3.
- 61) The tendency to engage in wars, aggressively, could be seen as an example of national maldevelopment, just as the tendency to engage in violence can be seen as a sign of personal maldevelopment - in either case on the assumption that no reasonably justifiable cause can be invoked.
- 62) There are new signals, however (1974), particularly coming out of UNCTAD (because of the influence played by the 77 - now 97) and UNEP (because of the way in which the whole ecological issue constitutes a new basis for thinking about development in general).