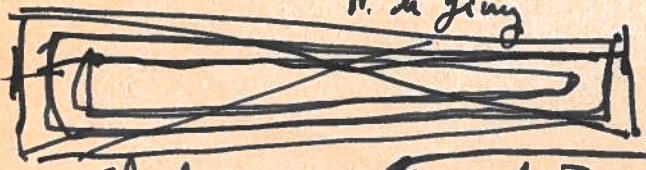


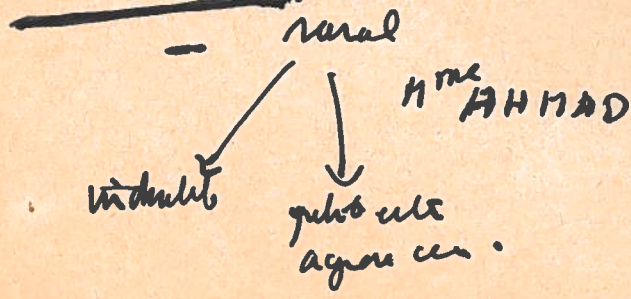
Bombay ^{Genev. 2.76} (1) 1741/5

- C.L.I. HAN KIKER fundatura
- proje ergonomis KRONER?
- M: BROW ^{argenti} _{regim - argenti}

→ Thailand **BANGKOK**
document apparet per
N. M. Jany



Philippines
Indonesia Singapore
Malaysia



- crymatisation de Karwellens ⁽²⁾
maux

- Visité à 2014 - Manille

page INDOONESIE

Eryomnis, \angle Arie
capacité des plantes

visu malin
Cohesion musculaire
hélice

suggestion de force suggère
du pays
du lumen de gaze

baliment le opiac

technologie | luter
manipuler | intensive

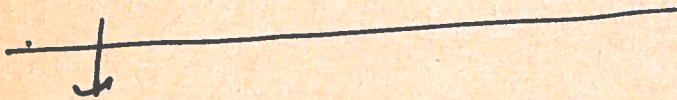
accompagnement
côté des accidents et
des maladies en Aris

(MASTRO - MATTEO)

côté de la fabrication
de l'Harmon.

côté en direction
x4 ?

↳ côté des incidents



↓
agence de production
le vois



↳ Sympson
NirDy fille de Dy oms

- Transferts Technologiques | 2002 F9
SIVR 2002 (4)

- Mexico - production
- richesses sociales
- cond travail genéral
- communauté

- Philippines
- contacts?

SICA Agence d'assistance

Marcos → décentralisation
pour de la communauté locale

Man Dy

Secretary of Labour

MR BLAS HOPLÉ

- Oversupply of sugar

- Industrial development

- Electronics

- Cars

- MR Manuel DIA
scientifique.

- National economic development
Audrey SELOT

Social Sciences Research (5)
Council
University of Philippines
- Institute of Philippine
Culture (Jesuit)
ATHENEUM Manila.

Mr AHMED

P.I.A.C.T.

property of earth

~~XXXXXXXXXXXXXXXXXXXX~~
Bangkok II: Ali Khan
moral problems

~~XXXXXXXXXXXXXXXXXXXX~~
Philippines.

F.A.O. representative

WORZ Germany

160 GRANGER →

She is in Philippines.
and would like to do the same
(as she does) in Indonesia
I have to do it far over !!

ask Agy Khan (agriculture college) (5)
for Indonesia

BGGOR institute

UNRESTANT
social and economic
implications of technological
changes —

Prende le Cillet
Avec un mètre

.

—

g

z

Information and training needs for choice of technologies and working conditions

a prepared paper by D. WISNER* for the Asian consultations
on working conditions, technological choice and development
(Manila December 1977)

1.0. INTRODUCTION

Les conditions de travail et de vie dépendent d'un grand nombre
de décisions qui sont prises à deux niveaux les plus
divers d'un pays et selon des critères multiples. C'est à partir
des ~~ses~~ conditions ^{concrètes} ~~concrètes~~ que va s'élaborer le nouveau visage
du pays, celui de son développement économique et social.

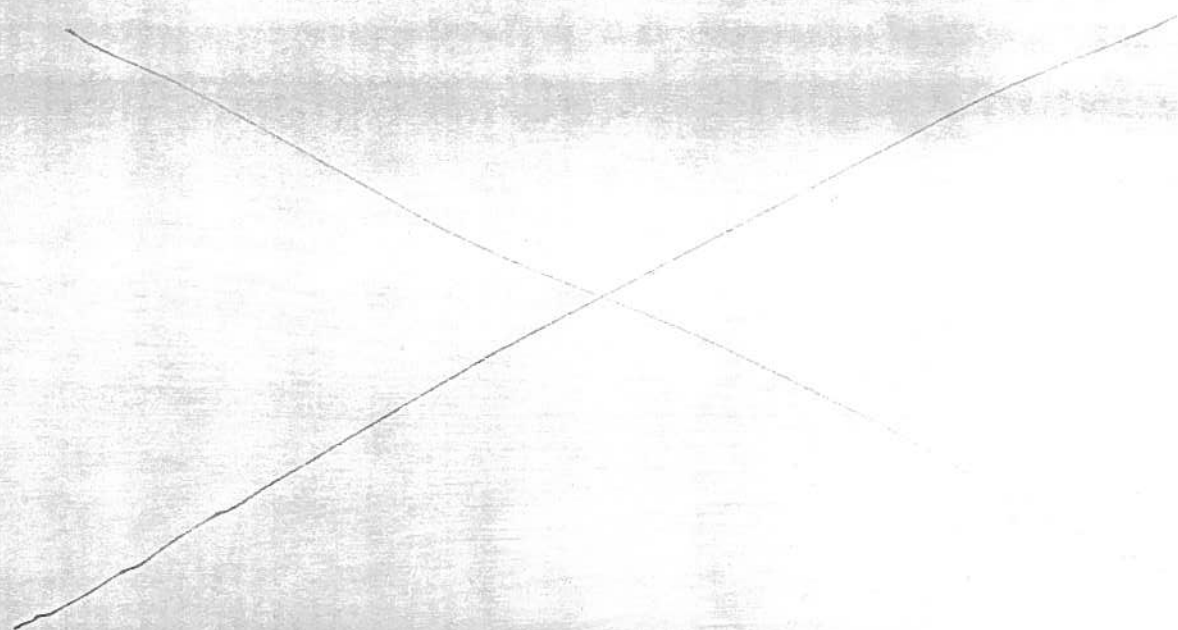
Il y a 20 ans, l'opinion prédominante était que, ~~de fait~~ ^{l'en pauvre}
~~facilement~~ classer les divers pays du monde sur une
seule échelle, celle du revenu par tête ^{habituel} qu'il en
prenait comme indice essentiel si ce n'est unique de la
reussite économique et sociale. Ainsi tous pays ~~étaient~~ ^{étaient}
considérés en ~~fonction~~ ~~rapport~~ rapport avec les pays les plus ~~riches~~ ~~riches~~
industrialisés puis comme modèles ~~à imiter~~ ~~de~~ ~~la~~ ~~civilisation~~.

Or le Produit National Brut (P.N.B.) ou son dérivé
le P.N.B. par habitant ne met que l'indice de l'activité
économique mercantile. Cet indice est de plus critiquable
en pays industrialisés car il laisse de côté ^{économique} ~~la~~ ~~part~~
mens de famille et une grande partie de l'activité de
l'agriculture de type traditionnel. Il devient grossièrement
inexact dans le cas des pays en voie d'industrialisation.

* Professeur de Psychologie du Travail et d'Ergonomie au Conservatoire
National des Arts et Métiers. 41 rue GAT-LOUSSAC 75.005
PARIS - FRANCE

à la part de l'activité économique ~~qui~~ les ces
 systèmes traditionnels en encas largement prédominants
~~La~~ description de l'évolution ~~de~~ PNB économique en
 termes de PNB ~~prob~~ tend ^{de fait} à valoir de l'activité
 l'accroissement de la production ~~mercantile~~ et à dissimuler
 la réduction éventuelle de la production ~~fonctionnelle~~ ou
 illégale non mercantile, c'est à dire à ~~ne pas~~ ^{ne} faire
 apparaître que les aspects positifs de l'industrialisation
 dans l'économie nationale et non pas ~~les~~ ^{ses} aspects négatifs
 sur la vie individuelle

Au fur et à mesure que l'industrialisation ~~se répand~~ ^{se répand}
 dans les parties du monde les plus diverses, on s'aperçoit
 que ~~le~~ ^{l'industrialisation de nos jours est} problème extrêmement
~~le~~ ^{le} problème est ~~un~~ ^{un} problème plus complexe. Certains
 pays ont atteint un PNB très élevé, mais les signes de
 d'insatisfaction sociale s'y multiplient au fur et à mesure
 que les anciens systèmes de ~~production~~ ^{production} s'effacent et que les
 nouveaux systèmes de ~~production~~ ^{production} se révèlent moins parfaits



à première vue

qu'il n'y paraîtrait. Dans d'autres pays la croissance économique ne bénéficie qu'à une partie limitée de la population, la classe moyenne ou ~~la classe~~ ^{de la} plus large la population urbaine. Trop souvent, les paysans qui représentent encore les 3/4 de la population du monde demeurent désemploés qu'aujourd'hui ce ne l'avaient encore plus pauvres. Le mode même de l'industrialisation en a souvent mis en question. Certains pays privilégient les industries lourdes qui assurent à terme l'indépendance économique ~~à terme~~ au prix parfois d'un endettement très lourd qui compromet le niveau de vie ~~économique~~ des masses urbaines et paysannes. D'autres pays accueillent l'étranger, les ~~industries~~ ^{investissements} étrangers qui produisent des biens ayant peu de rapport avec les besoins primaires du pays mais assurent un bon ~~rapport~~ ^{appui} financier important au ~~secteur~~ ^{secteur} public. ~~Pour~~ ^{enfin} Dans le domaine agricole, ce sont surtout les ~~secteurs~~ ^{secteurs} plantations à capital national ou étranger qui sont privilégiées car elles permettent au pays de participer aux échanges économiques internationaux, surtout ^{au moyen} des coopératives de production traditionnelles ~~à~~ ^{orientées vers} les cultures à vinifier et permettant d'assurer l'alimentation convenable ~~de~~ ^{de} la population du point de vue ~~de~~ ^{de} quantité et qualité.

Le but de cet exposé n'est pas de traiter les questions qui viennent d'être évoquées. Il s'agit là de grands

questions d'economie politique qui sont liées par
 les gouvernements en fonction d'illusions sur pays et
 des perspectives d'avenir qui leur sont propres. On doit toutefois
 insister sur le fait qu'elles déterminent l'ajustement des
 conditions économiques de travail et de vie de la population.
~~Pour~~ Peut-être est-il bon de souligner également que
 la discussion relative aux modèles de développement
 de l'economie et de la société n'est pas jugée dans pays
 dits au développement économique et que les pays
 les plus ~~moins~~ développés suivent ~~de~~ actuellement des
 voies assez différentes et peuvent en changer.

Le ^{thème} ~~but~~ du présent essai est plus technique et
 plus limité que celui de l'economie politique. Il ne
 pourra toutefois s'échapper complètement, car les notions
 techniques ont souvent marqué de façon assez profonde
 par la représentation ~~différente~~ qu'ils ont de l'Homme et de
 la société.

Un accord se fait progressivement entre les observations, par
 conséquent que "un dispositif technique et l'organisation qui lui
 est associée (le "hard" et le "soft" de l'industrie électronique) nous
 pour leur pleine réussite une conjonction ^{de ces deux aspects} de
 cadres, structures et de leurs familles d'éléments de base
 original. L'industrialisation = la technique, la structure
 du travail ne sont pas neutres. Elles impliquent
 ceux qu'elles touchent selon des modalités qui impliquent
 ou implicitement convergent avec une vision que les

ou est un incubateur
 ont conçues. Si la transformation n'a pas lieu, le
 des parties technico-organisationnelles ~~est~~ a une particularité
 majeure ou quantité et qualité à celle qui était prévue
 l'ad regrettée sur le plan économique qui ne peut être
 pensée être le signe d'une saine réaction de la main
 antérieure vis-à-vis de la causalité brutale qui la
 a imposée. Si la transformation est obérée d.
 par un choc social coûteux, payé supplémentaire
 du pays originaire, mais la réaction collective
 aura été immédiatement traversée et un nouveau
 apparaît à travers les crises du système industriel
psychopathologie, éthologique, sociologie industrielle
 et politique etc.

Compte tenu des conditions générales précédentes qui peuvent
 d'ailleurs être inclus dans un programme de formation
 on considérera, dans une première partie le champ
 des connaissances nécessaires pour le champ technologique
 et les conditions de travail, et une deuxième partie
 on venra ~~considérer~~ ^{que le savoir que} les divers graves succès d'avant
acquies pour contribuer à des résultats satisfaisants.

2.0. LE CHAMP DES CONNAISSANCES

L'idée que l'on puisse obtenir une technologie récente
 qu'une autre, modifier une machine pour améliorer
 les conditions de travail en relativement simple

Elle est directement apparue à la "one best way" qui a été une des idées maîtresses de la 2. révolution industrielle et qui continue à être largement prônée par les vendeurs de technologie surtout s'ils représentent un bien particulièrement puissant dans la monde ou dans une région du monde. En réalité, il n'y a guère de résultats qui ne puissent être obtenus par des moyens techniques très divers ; mais de toute évidence le rapport coût / bénéfice n'est pas le même pour toutes les techniques. ^{et donc dans les pays} Les critères économiques d'adoption de ces outils de faire les devoirs si l'on considère ce genre de "produits" un dernier exemple économique d'apparence solide devant toute décision, grands ou petits. Malheureusement, les bases de ce dernier sont parfois bien fragiles car elles sont très différentes de celles qui prévalent dans le pays à destination si elles sont très limitées dans leurs appréciations évaluent les effets.

~~Donc dans ces cas~~

les bases différentes peuvent être de nature géographique : (climat, voies de communication), sociales (niveau de vie, de la main d'œuvre qualifiée et des cadres), économiques (importance et stabilité du marché local ou régional)

L'évaluation des effets peut ~~être~~ ^{être} ~~appréciation~~ ^{peut} être très variable ce qui concerne la population des bénéficiaires et de leur famille (migrations importantes, un déplacement des campagnes et expropriation de la campagne), l'environnement

(pollution de l'air et de l'eau avec pertes de rendement agricoles indéniables), l'absence d'infrastructures

(zones de zones détruites des structures sociales anciennes, sans industrialisation, obsolescence)

Toute évolution de la vie économique et sociale doit être appuiee sur le ~~concept~~ ^{concept} de ~~certains~~ ^{certains} ~~secteurs~~ ^{secteurs} ~~national~~ ^{national}, liés à la nation, à l'entreprise et aux ~~familles~~ ^{familles}. C'est ainsi qu'un malade, par exemple, en devenant un ~~malade~~ ^{malade}, ~~il est de son état~~ ^{il est de son état}, un meilleur état santé, un plus haut niveau de compétence technique, etc., etc., en rapportant aux 3 entités - nation, entreprise, famille - de façon très différente ~~selon~~ ^{selon} le système financier et social.

On peut regretter que les ^{études} ~~travaux~~ ^{travaux} habituellement cités dans le domaine de l'adaptation de la technologie à la population ~~et~~ (sociologique) et de ces études de l'adaptation du travail ^(ergonomie) ~~à la~~ ^{à la} ~~population~~ ^{population} ~~et~~ ^{et} ~~ceci~~ ^{ceci} ~~habituellement~~ ^{habituellement} un caractère négatif insistant sur les effets négatifs, les coûts sociaux du changement technique. ~~Il ne s'agit~~ ^{Il ne s'agit} d'une telle attitude si elle devient systématique, est inadmissible car il faut ^{accroître} ~~augmenter~~ la ~~ressource~~ ^{ressource} des populations qui dans la plupart des pays d'Afrique du Sud-Est augmentent de 3% par an ~~tout~~ ^{tout} ~~en~~ ^{en} ~~accroissant~~ ^{accroissant} annuellement ~~de~~ ^{de} 5, 6, 7% a plus si on considère que grâce à des innovations technologiques au ~~dans~~ ^{dans} ~~l'industrie~~ ^{l'industrie} et l'agriculture. ~~Il ne s'agit~~ ^{Il ne s'agit} donc d'agir que de contribuer à la ~~recherche~~ ^{recherche} de ce changement technique.

par la présentation des données d'après ce
domaine des nuances de l'habitat dans des termes
utilisables par les dirigeants industriels et les ingénieurs
dans la perspective d'un développement socio-économique rapide.

On peut diviser le champ des connaissances nécessaires
dans l'industrialisation et aux bonnes conditions de travail
en deux vastes domaines : celui de l'urbanisme et de l'adaptation
à la technique, celui de l'habitat, celui de l'adaptation
à la technique de l'industrie et à l'agriculture.

2.1. Sociotechnique : dans et à l'adaptation de la technique
à la société. Les disciplines sociotechniques nécessitent
de connaître la culture sociale, les coutumes, les
habitudes, les ^{et dimensions} ~~contours~~ de la vie, l'urbanisme, l'agriculture,
l'économie.

2.2. Géographie à dimension humaine. Il est bien évident
que la nature des sols, le relief et le réseau hydrographique
le régime des pluies et le climat sont des agents déterminants
aussi bien pour la création d'un vaste complexe industriel
dans la Vallée de la Côte d'Ivoire que pour la construction
d'une usine de camion ^{en TRAFIC} dans le Sahel de
l'Empire. Mais les ressources de la géographie
humaine vers les techniques connues ~~de l'industrie~~
sont variables d'un cas à l'autre.

Des terres fertiles, un fleuve au débit régulier, un climat
ne suffisent pas pour attirer le régime de l'industrie
même si il s'agit de savoir que tel existe dans
une forte concentration de population dans le régime

nomme de KORHOGO, fait assez rare dans le region
 si la densite de population est tres faible depuis les guerres
 de ces dernieres decennies du XVIII et du XIX siecle. Il faut également
 mentionner que la population de la region de KORHOGO occupe
 un partie de l'annee par les cultures vivrieres sont pittoresques
 desjambes qu'on voit a la periode de coupe de la canne
 a sucre. Les pays (N. COULIBALY, directeur de l'Institut
 de Geographie d'ANTIDJAN). Les connaissances
 geographiques nous apprennent aussi que l'extension
 de la canne d'occure est en fait relative et qu'il faut
 faire appel a nos connaissances de l'ancien monde
 de l'Asie ou d'Australie de l'ancien monde
 et de l'ancien monde, d'ailleurs dans l'ancien monde
 d'ailleurs le canne qui fut le canne de l'ancien monde
 dans l'ancien monde dans le pays de culture de la canne
 au nord en permanence. Le sucre employe comme a l'Est
 de SAO PAULO au BRASIL au l'Etat de NESPOS de l'ancien
 monde PHILIPPINES, la geographie humaine ^{de l'ancien monde}
 arguments certains a l'antiquite de la de modern
 a ceper. La geographie climatique nous apprend
 d'ailleurs aussi que la periode de coupe est l'ancien monde
 plus longue au BRASIL et aux Philippines, que
 l'Etat PHOENIX et pour l'ancien monde et l'ancien monde
 permanent ou quasi permanent.

2.1.2 Anthropologie et ethnologie On peut

s'imaginer que l'on suggere dans un programme de
 formation scientifique d'inclure des connaissances
 et ethnologiques alors qu'~~on s'agit~~ ^{en suivant} le ~~modèle habituel~~ ^{modèle habituel}

des pays industriels, un appareil sociologique devient
suffisant dans le domaine de la collection.

En réalité, il n'ajoute ~~pas~~ le phénomène sociologique
qui sur l'angle de la sociologie ~~et~~, des ses méthodes et
des théories, au côté le risque considérable de rapprocher
des phénomènes dans l'origine et les dés, avant et
dans la dynamique est de ce fait profondément
divers. Peut-on rapprocher sans précaution les
10.000.000 h de l'agglomération de MEXICO et
10.000.000 h de l'agglomération de PARIS. Peut-on
parler du dommage à ABIDJAN comme un empilement
à LONDRES ou à NEW-YORK ?

Le système industriel est un puissant ~~antagonisme~~
distinctif ethnique et sociologique ~~et~~ et malgré cela
dans ^{un} ~~les~~ pays industriels et centralisés comme
la France, on voit apparaître le côté ^{politique, économique} ~~socio-politique~~
et social d'une ~~une~~ excessive unification et
l'évolution de diverses parties du pays. ~~et~~ A plus
forte mesure dans les pays où ^{coexistent} ~~subsistent~~ des ethnies
ou des peuples ayant une histoire, un âge et évolution
ethnique, un système de valeurs différent, il est très
dangereux de ne pas tenir compte de ces différences
même si le but du gouvernement est d'obtenir la
convergence nationale. On peut citer dans ce domaine
les remarquables travaux de développement
d'anthropologie de l'Université des Philippines
(P. SOCANO) ~~et~~ ceux de l'Institut d'ethnologie
anthropologie de l'Université d'ABIDJAN ~~et~~ ceux
des anthropologues de l'Université de MEXICO.

INTERNATIONAL LABOUR ORGANISATION

INTERNATIONAL PROGRAMME FOR THE IMPROVEMENT
OF WORKING CONDITIONS AND ENVIRONMENT (PIACT)

Philippine National Tripartite Conference on Improving
Working Conditions and Environment

(Manila, 12 to 14 December 1977)

Working Document No. 4

Choice of Technology and Working Conditions:
A Social Assessment Framework

Evolution

←
by

Bruce Koppel

East-West Center, Honolulu

(Concurrently: Visiting Professor
SEARCA College, Philippines)

Geneva
International Labour Office
1977

Introduction

This paper was written at the request of the Conditions of Work and Life Branch, Working Conditions and Environment Department, the International Labour Office. It is a response to, commentary on, and supplement for a document produced by the Branch entitled: "Working Conditions and the Choice of Technology: Research Design." The objectives of the research proposed there are:

- "(a) to define and to quantify the effects on workers and on their working conditions of various types of technologies;
- "(b) to document the connection between technological choice and working conditions; and
- "(c) to establish a list of policy and technology options together with their social implications."

The program envisaged in the document begins with a number of pilot case studies, the objectives of which are, in addition to (a) and (b) above, to enable the Conditions of Work and Life Branch.

- to evaluate which research methodology is most appropriate in systematically investigating the problem or aspects of it;

- to provide preliminary information on any policy or strategy that has been introduced to cope with the problem and its subsequent results; and
- to aid in the development of a methodology which allows for a careful assessment of the consequences of technological choice on working conditions.

The objective of this commentary is to build on the ILO document and more specifically to develop an analytical approach to the aforementioned research goals.

Introductions

1. Effective research on the choice of technology and working conditions, --- designed to influence public and private policy in a significant manner, --- will require careful delineation of available scope for flexibility in technological and organizational choices; open confrontation with potentially intractable goal conflicts between productivity, competitiveness and efficiency targets on one hand and employment, equity, and manpower utilization goals on the other hand; acceptance of the distinction between an argumentative advocacy of a "bill of rights" and an iterative search for feasible optimization paths; and perceptive incorporation of significant contextual factors which influence the likelihood of particular choices, limit the likelihood of others, and in general define the mix of technology matrix within which choices are being recognized, weighted, and implemented. Effective research will not ignore more "basic" inquiries; quite to the contrary, it will not begin where consensus exists but rather where significant gaps in understanding remain. However, the design of effective research involves a strong orientation to the decision-making process. The link from basic inquiries to option generation is the role of assessment methodologies and participatory processes in effective research.

Assessment: A Summary

2. Assessment asks several questions which are of particular relevance to the issue of choice of technology and working conditions.

- a. What are the higher-order impacts, the "effects of effects"? Analysis of higher order impacts is the major route to uncovering unintended and unanticipated consequences, both positive and negative.
- b. Assessment implies more holistic analysis. Problems are defined systematically and , while problem-bounding is a persistent difficulty, criteria for bounding are not derived from the divisions of disciplinary domains but from attempts to discern relatedness, linkage and interdependence within an existing or emerging system.
- c. Are there likely irreversibilities being courted? Irreversibility as the imposition of damaging impacts which incur irrevocable losses is becoming well understood, -not so well understood is irreversibility as the restriction of future options. Technological and organizational choices often narrow the domain

of future choices; — a difficulty if the ceteris paribus or projection assumptions about market conditions or the "state of technology" prove incorrect.

- d. Is a technology choice sustainable? Can implementation continue without incurring higher adjustment costs with time? Will implementation generate a succession of adjustment problems that ultimately will undermine the viability of the initial choice? Piece rate wage approaches to productivity often prove unsustainable because of diminishing returns to incentive programs and other factors which operate to establish productivity norms. Accommodation to these problems often results in byzantine incentive systems which are too mysterious to motivate; too complex to administer, and thus operate with the reverse of the desired effect. Sustainability is especially critical for imported technologies, where complementarities (maintenance, skill levels, control systems, raw material flow continuity, etc.) are often not present and where the trade-offs involved in utilization (e.g., labor displacement rather than specialization) are different.

- e. Assessment seeks to identify and evaluate alternative options. This implies an iterative and, to a degree, a circular process. It also implies that assessment is not purely an analytical question; it is also a question of involving affected and affecting parties in identifying options, incorporating relevant value weights in the analysis, and in evaluating the multiple aspects of implementation.
- f. Assessment can revolve around varied combinations of technological and social problems, but assessment will always concentrate on the interrelationships between technology choices and social, economic, cultural and political processes. The social goal and normative orientation of assessment is, in fact, what distinguishes assessment from techno-economic evaluation. The issue is not whether a technology will work or whether it is economically feasible, but rather does a technological application make a significant positive contribution to the realization of some social goal. That, of course, is a very complex matter, involving problems of operationalizing goals (in particular, distinguishing between social goals as public goods and as the aggregation of private goods), evaluating goal conflicts, institutionalizing an

assessment capability at a point least likely to lead to "technical fix" distortions, identifying appropriate non-technical information and incorporating it at significant points in the decision process, etc.

Nevertheless, in principle, it is entirely feasible to drive an assessment by optimization of working condition goals. The utility of such an assessment will depend on the degree to which the significance of other goals is fully appreciated and options identified which do not require complete abandonment of strongly held economic and technological efficiency objectives.

An Analytical Framework

3. The application of an assessment perspective to the issue of working conditions and choice of technology can proceed provided certain caveats are first entered.

- a. Existing research on choice of technology and working conditions is voluminous, but not entirely consistent even on very basic points. For example, there is little consensus on the major determinants of work organization, proponents being divided instead among 3 positions: technological process, size of firm, and culture. If research proceeds on the basis

of any one, the identification of problems and opportunities and the derivation of specific options will be quite different. The first two positions support convergence propositions and the plausible pursuit of common goals; the third position would emphasize diversity and with it, the potential inappropriateness of "universal" goals. The lack of consistent research support for any of these (or other) positions implies that a priori acceptance of a technological, scale, or cultural imperative as the starting point for assessment research would be unjustified.

- b. The search for paradigms can often be a hindrance to understanding. Research designed to generate and influence significant decisions should concentrate on two objectives. First, the research should identify the dynamics through which technological choices and working conditions interact. This is considerably more complex than developing an inventory of impacts, a step which, if not carried further, can be characterized as the error of misplaced precision. Identifying points where new flexibility is required or where existing flexibility can be constructively used implies looking

at a complex system and recognizing the aspects of the system which make a difference, the relationships, in other words, which are strategic. For example, the identification of primary impacts is not necessarily the specification of most significant impacts. Higher-order or indirect impacts are often more strategic in the sense of transmitting, magnifying and distorting the effects of a technological application and more significant in the sense of directly influencing outcomes on the worker, his job satisfaction, frustrations, etc. Second, the research should focus on the generalizability of suspected strategic relationships. This requires between-industry and within-industry studies under diverse settings. However, it also requires special attention to the sustainability and irreversibility issues. Under what conditions, for example, will the relationship shift work → family instability → job stress dissipate? If there are special factors which modulate fuller appearance of this relationship (e.g., extended family structure) is that modulation durable over the longer term? In certain contexts, is shift work an irreversible step that forces future consideration of labor displacing technologies?

- c. The presence of potentially irresolvable goal conflicts in the choice of technology - working conditions issue cannot be sidestepped. The burden of proof will be on the research in many instances to demonstrate that options which improve or at the least prevent the deterioration of working conditions can be constructed and implemented without adversely affecting productivity, employment generation, firm survival, etc. The research will have to carefully evaluate and in most instances avoid categorical goal statements. It will need, in other words, to substitute rigorous optimization among goals that are not fully compatible for the ineffective advocacy of particular "rights."
- d. If the research is unclear about its principal intended audience, it is very unlikely to be effective research. The principal intended audience should be those who are directly making or through policy influencing those who directly make technology choices and in some sense are the final arbiters at the firm level of trade-offs affecting working conditions. That implies several points. First, special attention needs to be paid to the context which yielded the need for a

technological choice. What type of bottleneck was uncovered? What type of opportunity was perceived? The choices may be responses to unpredictabilities in the policy environment for example, which can best be met by attempts to stabilize policy rather than by "social fixes" to accompany technological responses. Second, and closely related, it is necessary to distinguish between some 'objective' understanding of the complex linkages between choices of technology and working conditions and the perceptions of those affecting or affected by decisions on the choice of technology and working conditions. Perceptions will not be the simple reflections of perverse misstatements or even of partial understandings; -- they will reflect alternative and deeply based value premises that cannot be divorced from any ultimate identified range of options, third, where labor and management interests are not fully congruent, the range of options will need to reflect where decision-making power resides. In many instances, but for diverse reasons, that will mean that only marginal "social fixes" will be acceptable for examination and possible implementation. This should not be a source of discouragement, but rather a helpful indicator of where to concentrate energy.

4. As is true with any research, data collection is only one of a number of elements for assessment research. However, unlike other research, assessment calls for a significant degree of iteration, an expansion of plausible scenarios to generate strategic options for the most likely scenarios. Assessment has been characterized as principally a normative science enterprise, asking what ought to happen, but necessarily building on a positive science problem: What has happened. A research design to identify strategic elements of the technology-working condition complex and to facilitate identification, analysis, and evaluation of options which emphasize the workers, that is, a social fix, needs to cycle through a number of steps.

- a. What is the technological choice at issue? What are the characteristics of alternative choices? How does each interact with existing technological and working condition endowments?
- b. What are the principal working condition impact categories?
- c. What are the higher-order, indirect impacts?
- d. What are the strategic impact categories? How durable is the "strategicness" across different technological mixes and endowments, varied degrees and types of change, and a range of firm sizes and industry sectors?

- e. What is the "technological" imperative? What exogenous or competing variables might account for observed systematic relationships subsumed by the concept of the "technological imperative"? What evidence is there to support the specification of limits on the durability and flexibility of the imperative? What complementarities are required to strengthen the imperative? What complementarities inadequately or inappropriately present tend to diminish the imperative?
- f. What bottleneck and/or opportunity supports the attempted "technological fix"?
- g. What are the major constraints on the fullest realization of the technico-economic objectives of a technological fix?
- h. What is the scope for a "social fix" that either minimizes a technological imperative without significantly sacrificing techno-economic gains or maximizes what amounts to a social imperative without imperiling techno-economic viability?

The steps are not unilinear, but rather marks on a circle through which analysis may have to run several times. For example,

identification of options in step H. requires recycling through A - G to analyze and evaluate impact. A social fix which presumes no aspect of the existing workplace social system need be altered and a technological imperative that indicates implementation of a technology will mandate changes in workplace social system is a conflict which must be resolved through evaluation of the likelihood the full imperative will be realized, the context which yielded the perception and selection of the particular technology and the possible compensatory or equivalent contribution of some social fix.

Data Requirements

5. The Technology Choice. What is the technology being considered? In what ways is it different from what is already present in the firm? How is it expected to interact with and/or substitute for the technology mix and overall technological endowment? What are the perceived risks?

5. The Principal Working Condition Impact Categories.

This typology was the subject of the aforementioned ILO document, "Working Conditions and the Choice of Technology: Research Design." The typology presented here modifies and adds to the earlier typology. Five impact classes are identified with 9 impact categories. The assumption is that the classes will be relevant

for all cases, but all the impact categories may not be appropriate.

Class 1, The Work

Impact Category 1. Work Organization/Job Content

Indicators:

1. Type of production system. (This is derived from sociotechnical system analysis. The emphasis should be on defining the technology in terms of the demands it makes on socio-physical arrangements. The production system is the intermediate mechanism for transmitting those demands. It presumably establishes a set of minimal tasks which control and planning systems will need to face.)
2. Functional Differentiation. Into what functions can a process be disaggregated? What is the relationship between a technological change and the maintenance of existing functional divisions?
3. Workspace flow
4. Work loads and job descriptions (task comprehensiveness)
5. Task content.
6. Output standards.
7. Employee density

8. Spatial concentration similar tasks.
9. Spatial concentration within function.

Class 2. Conditions to Work

Impact Category 2. Social Relations Within Firm

Indicators:

1. Employee interaction (frequency, scope, stability).
2. Workgroup formation, recruitment, maintenance; controls on.
3. Social composition of the firm social system.
(Stratification bases, skill, age, sex, race, rural-urban origin, occurrences of cohesion, friction)
4. Informal helping, learning system.
5. Instances and sources of shopfloor friction.
6. Number of employees distributed by function/task/job title.

Impact Category 3. Control System

Indicators:

1. Task/work allocation. How organized? (Divisions, levels, sections, job titles) What are the criteria?
2. Centralization/decentralization. Over what issues do different levels in firm hierarchy have authority

or significant decision-making scope. Who participates in identifying the need for a decision, defining the options, and actually making decisions for different types of problems (Process related, worker efficiency related, etc.) and at different levels?

3. How is feedback organized? Is this a techno-economic function measured in terms of output volume stability or does it represent the input of several divisions or levels?

Impact Category 4. Employment/Security/Termination

Indicators:

1. What is the recruitment process? What are the stated and implicit qualifications (education, experience, age, sex, race, urban/rural origin, income, marital status, income)?
2. Is there training or retraining? Under what circumstances and for whom?
3. What is the evaluation/promotion/rotation process? What are the criteria?
4. What is the dismissal/turnover rate? What are the major causes? Are there protective mechanisms operating?

5. What are the costs of holding a job in terms of transportation costs, equipment and uniform costs, etc.

Class 3, Conditions for Work

Impact Category 5. Hours of Work

Indicators:

1. Standard working hours
2. Length and distribution of overtime
3. Standard work week
4. Shift work. How is it organized?

Impact Category 6. Physical Conditions

Indicators:

1. Noise, vibration
2. Light
3. Heat
4. Air quality
5. Space
6. Chemical/mechanical/electrical hazards
7. Industry specific hazards and ergonomic problems.
8. Accidents (rate, type)

Impact Category 7. Remuneration

Indicators:

1. Bases for payment. What is it? Is it understood?
2. Indirect benefits. What roles do employees have in accepting, evaluating or modifying indirect benefits?

Class 4. Conditions of Life

Impact Category: Social Indicators

Indicators:

1. Housing
2. Supplementary income sources
3. Family stability
4. Family size
5. Kinship obligations
6. Health
7. Social status
8. Access to essential services
9. Education/mobility (for employee, employee's spouse and children)
10. Leisure
11. Migration

Class 5. Job Satisfaction

Impact Category 9. Job Satisfaction

Indicators:

1. Attitudes about the work
2. Attitudes toward remuneration
3. Attitude toward the firm
4. Attitude toward the work group

The Working Conditions Impact Inventory is summarized in

Table 1. Several points about impact indicators should be noted.

- a. Indicators cross 3 levels of analysis: firm, workgroup, individual. Distinctions need to be made between impacts that operate at these 3 levels and the interaction between levels.
- b. Indicators touch 3 types of impact areas: human relations and management, the conditions within which human relations and management function, and the criteria by which the adequacy of human relations and the contextual conditions are appraised. Here again, distinction needs to be made between areas and special consideration given to interaction.
- c. Specific measures have generally not been provided. This allows room for development of within industry categories and for culturally specific instruments.

Table 1. Working Conditions Impact Inventory

<u>Class</u>	<u>Impact of Category</u>	<u>Indicators</u>
The Work	1. Work Organization/ Job Content	1. Type of production system
		2. Functional differentiation
		3. Workspace flow
		4. Task content
		5. Work loads and job descriptions
		6. Output standards
		7. Employee density
		8. Spatial concentration similar tasks
		9. Spatial concentration within function
Conditions to Work	2. Social Relations Within Firm	1. Employee interaction
		2. Workgroup
		3. Social composition
		4. Informal helping
		5. Friction
		6. Number of employees
	3. Control System	1. Task/work allocation
		2. Centralization/decen- tralization
		3. Feedback
	4. Employment / Security Termina- tion	1. Recruitment process
		2. Training/retraining
		3. Evaluation/promotion/ rotation
4. Dismissal/turnover		
5. Costs		
Conditions for Work	5. Hours of Work	1. Standard Working hours
		2. Length and distribution of overtime
		3. Standard work week
		4. Shift work

<u>Class</u>	<u>Impact Category</u>	<u>Indicators</u>
	6. Physical Conditions	<ol style="list-style-type: none"> 1. Noise 2. Light 3. Heat 4. Air quality 5. Space 6. Chemical, mechanical/ electrical 7. Industry specific 8. Accidents (rate, type)
	7. Remuneration	<ol style="list-style-type: none"> 1. Bases for payment 2. Indirect benefits

Conditions of Life	8. Social Indicators	<ol style="list-style-type: none"> 1. Housing 2. Supplementary income 3. Family stability 4. Family size 5. Kinship obligations 6. Health 7. Social status 8. Access to essential services 9. Education/mobility 10. Leisure 11. Migration

Job Satisfaction	9. Job Satisfaction	<ol style="list-style-type: none"> 1. Attitudes about the work 2. Attitudes toward remuneration 3. Attitude toward the firm 4. Attitude toward the work group

d. The above 3 factors taken together strongly imply the nonfeasibility of any single or overall methodology. A mix will be required that reflects the relative accessibility of particular indicators, the combination of 'objective' and 'perceptual' data and variation in required degrees of calibration or sensitivity in indicator definition.

7. Higher-Order and Indirect Impacts. This is derived principally through cross-impact matrix analysis. The additional data required is that related to firm productivity and relevant economic indicators of a more or less successful operation.

8. The Strategic Impact Categories. This is derived principally through cross-impact matrix analysis. The major data requirements are from sampling to ensure variability in terms of various scale, market structure, industry structure, and labor market factors.

9. What is the "technological imperative"? Derived principally through cross-impact matrix analysis and secondary analysis of supplemented matrix data. The major additional data requirements above what have already been noted are for exogenous and competing explanations:

- a. Policy. Are there predictabilities or unpredictabilities in the policy environment which skew choice of technology and/or working condition choices in particular directions?
- b. Size structure of industry. Is there a consistent relationship between firm size and technological economies within particular industries?
- c. Geographical setting. Do the labor and infrastructure endowments of particular settings narrow the range of possibilities for working condition or technological arrangements?
- d. Product diversity. Does a fluctuating or variable product mix lead to conditions which narrow alternative relationships possible between given technologies and working conditions?
- e. Management/labor/ideology. Is there a widely held belief in particular technology working condition configurations such that the belief in inevitability makes the relationship inevitable?

Other indicators are, of course, possible. The thrust should be to examine plausible alternative explanations. A likely source for such alternatives are factors which narrow the empirical range

of technology-working condition configurations. If an exogenous factor accounts for the apparent systematic relationship, then the hypothesized 'technological imperative' can be significantly modified or even rejected altogether. Similarly, if an exogenous factor limits the empirical range of either technology or working conditions or forces wide variability of one, then a technological imperative may be masked. Another limitation on specifying an imperative is indication of "unique" conditions which may support a technological imperative. The factors already listed are principal examples. In late industrializing settings, where appropriate labor forces may be in thin supply and technological options may be highly limited, there may be apparent technology imperatives, particularly in high technology industries. However, this may well be a "late industrialization" effect which will be overcome by access to a broader technology pool and the mobilization of a broader cross-section of the labor force to skilled industrial strata. This will be one area where both over-time (historical) and comparative analysis will be needed, correlating e.g. changes in the composition of the labor force within a plant or industry with changes in the variability in technology-working condition interrelationships.

10. What supports a technological fix? Two types of data will be required here: 'objective' and perceptual. The principal

types of 'objective' data, in addition to the impact matrix and the additions already noted, are:

a. Underutilization or overutilization existing capacity.

This includes measurement of capacity utilization and incorporation of significant input or demand factors which support observed capacity utilization.

For example: Are there bottlenecks or interruptions in raw material acquisition or preliminary processing that lead to alternating periods of idle capacity and long queues? Is the effective demand for output in terms of volume, quality, diversity, etc. greater than what can currently be satisfied?

b. Scale economies not attained. Major sources of scale economies include indivisibilities, increased dimensions, specialization, massed resources, utilization of more efficient techniques, market control, etc. If a firm is close to these, it may seek a technological fix to go over the top.

c. Scale diseconomies operating. Major sources of diseconomies of scale include factor limitations, technical forces (stress and strain in equipment), management, and labor relations. Factors which are

supporting increase in unit costs as output increases may invite compensatory technical fixes.

- d. Unpredictabilities in operating environment. Major examples of unpredictabilities are labor turnover and policy. Either can lead to technical fixes to reduce unwanted variability in costs, etc.
- e. Inability to meet market demand. Examples are: inadequate output volume, inadequate output quality, insufficient product variability.

11. What are the major constraints on the full realization of the technical/economic goals of a technological fix? This question also requires a mixture of objective and perceptual data. Data categories that will be particularly relevant here are:

- a. Engineering/economic expectations for performance and returns. (Can be derived from simulations and/or cumulative plant studies available already.)
- b. Workforce qualifications
- c. Accuracy in analysis of need for a technological fix and adequacy of response (managerial qualifications).
- d. "Poor" technology
- e. Proximity to the technological fix. Sometimes, a technology is expected to have broad ramifications

on firm operations. In actuality, the ramifications may fall off rapidly with functional or spatial distance from the technology. This may reflect a misanalysis of process interdependence or an underestimation of the ability of the social system within the firm to limit the effects of a technological change.

- f. Overutilization or underutilization
- g. Maintenance/spare parts shortages making breakdowns a serious problem.
- h. Alterations in market demand and other exogenous factors which amount in effect to a modification of the conditions which supported the choice of technology. This can work both ways. For example, as rapid expansion of Indonesian textile industries in the early 1970's revealed, the market may be more competitive than was anticipated. Or, it may have been made more competitive by the appearance of so many new and expanded plants.

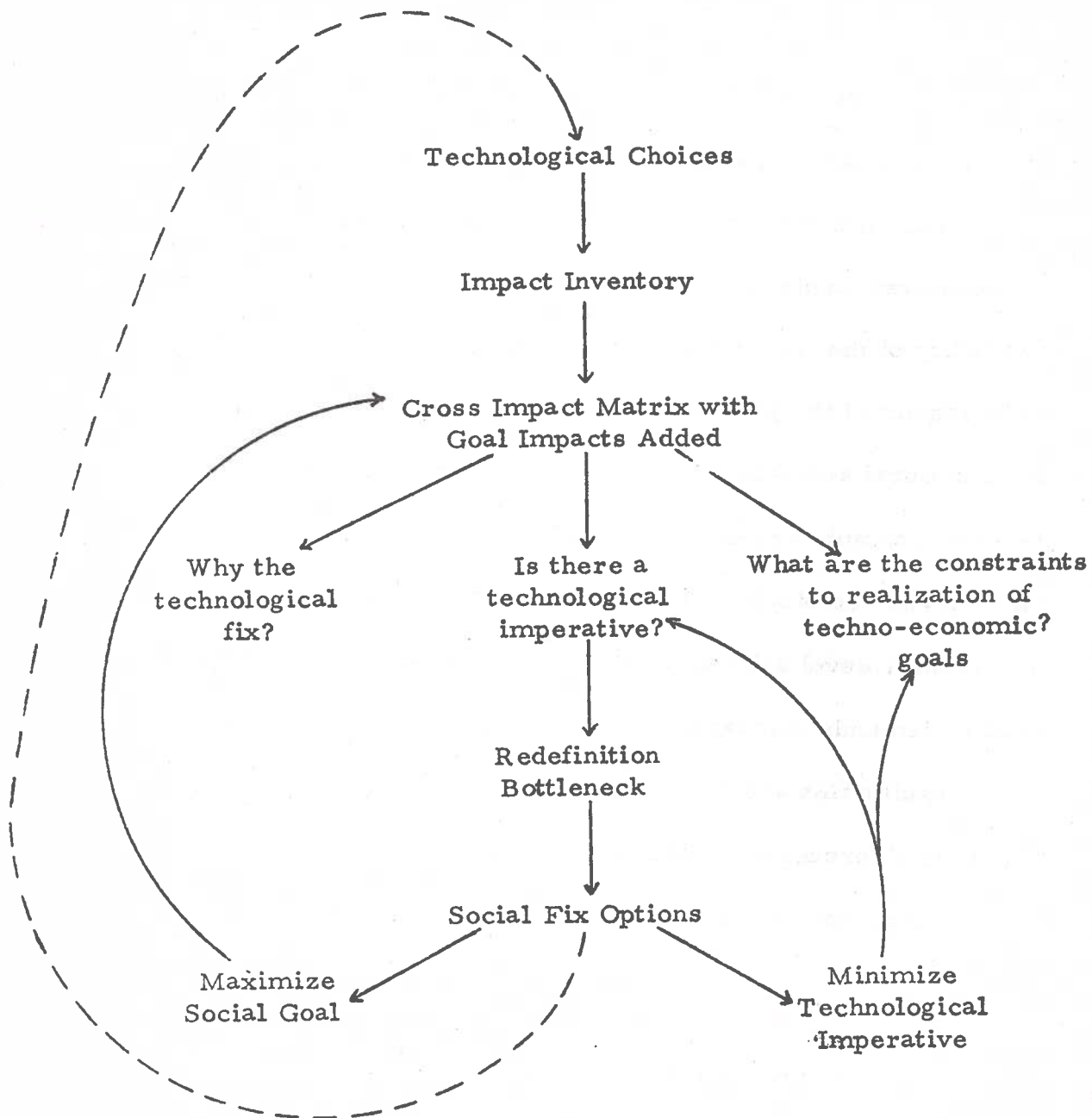
12. The scope for a social fix. The generation of social fixes must be externally supplied. The cross-impact matrix and related analysis can contribute the identification of strategic intervention points and provide a different light for the specification

and evaluation of techno-economic constraints. The issue is how to support any social fix option. The answer is suggested in Figure 1. Through a recycling and iteration on the matrix and on the questions asked through the analysis, the effect will be to generate scenarios. However, these are scenarios based on identified strategic patterns, on qualified technological imperatives, on more thorough understanding of the forces which yield perceived needs for a technical fix, the factors which limit the viability of the fix (including perceived techno-economic risks and the impact of the technological fix itself), and the role of policy, cultural and external economic factors. Joint optimization of techno-economic and social objectives requires understanding within a given sociotechnical system as well as of it. The former demands microlevel analysis that yields strategic understanding. The latter demands comparative and macrolevel analyses that shed light on regularities and variabilities. Alternative social fixes can be cycled through this data base and optimized against whatever techno-economic constraints are deemed appropriate.

Conclusion

13. The design is not for a one-shot research project but rather represents the basis for a continual, cumulative monitoring

Figure 1. Choice of Technology and Working Conditions: A Social Assessment Framework



of past and existing choices as an approach to anticipating the impacts of future choices. It is also the foundation for a cumulative monitoring that helps identify appropriate points and forms for policy intervention. At the same time, as evidence about the predominance of certain strategic linkages is obtained, the research can be supplemented by closer examination of those linkages. Finally, it should be noted that the research will also reveal social imperatives that may require minimization or even a compensatory technological fix. An obvious example is the unwillingness of workers in many developing countries to take safety precautions made available and encouraged by management. A social imperative can be identified through cross-impact matrix analysis, particularly where over-time data is available, and through examination of constraints to maximization of technoeconomic efficiencies expected from technologies in use.

14. A society can only control its own future when substantial options are available. The function of assessment is to help keep the door open on a wide range of options. However, to do this entails some uncomfortable costs. Reductionist problem definitions, the type which strongly dominates both academic and applied circles, need to be superseded by comprehensive holistic problem views. That will not be an easy succession, but it will need to occur nevertheless if options

are to be generated rather than numbers refined. As the ILO document points out:

"Due to the complexity of the relationship between the choice of technology and its social implications, no socio-technical assessment methodology is comprehensive enough to apply to all situations."

That is undoubtedly accurate, However, improving working conditions requires recognition of very complex factors and very interdependent systems. It is not only the social implications of technology choices, but the technological implications of social choices that need to be simultaneously viewed. If our inadequate knowledge of sociotechnical systems makes that seem a foreboding task, how much more foreboding is the advocacy of options inadequately assessed?

CONTENTS

	<u>Page</u>
I. INTRODUCTION	1
II. DEFINITION OF TERMS	2
III. THE RELATIONSHIP BETWEEN WORKING CONDITIONS AND TECHNOLOGICAL CHOICE	8
Product choice	12
Product design	13
Production facility design	14
IV. ADAPTATION	19
Worker-job fit	19
Indigenous technology	23
V. AGRICULTURE AND RURAL AND SMALL-SCALE INDUSTRIES	24
Working time	25
Working environment	26
Occupational safety and health	26
Work organisation and job content	27
VI. MEANS OF ACTION	28
Decision-making stages	28
The content of change	29

I. INTRODUCTION

The desire for a better quality of working life is often expressed in developing countries through their concern in the process of industrialisation. Industrialisation is the assumed key to economic growth, "modernisation" and survival in a highly competitive world. And technology is instrumental in achieving these goals.

However, technology is very frequently badly applied. The negative effects of technology are clearly manifest in poor worker-job fit, longer hours of work, shift¹ and night work², increased fatigue, occupational hazards and accidents. Moreover, while the potential is there for improvement, there are factors which favour inappropriate technology: the prejudice that the worker should adapt to the machine, low priority given to effects on easily replaceable workers, lack of knowledge. The harm from inappropriate use of technology falls most heavily on the worker, but it also has an inevitable impact on productivity. Thus a double price is paid in terms of development and it is a price which is paid over a long period of time, for once a production facility is in operation change can be very difficult and very costly.

Fortunately, poor applications of technology is not inevitable. Technology is not deterministic; there is not just "one best" way of producing a product or achieving a technological objective. There is not one best way of industrialising. The choice of technology means that opportunities exist not only to rectify past errors but to use technology to ensure good working conditions.

The potential of technology to improve working conditions is realised through technical decisions concerning product choice, product design and production facility design. These technical decisions, because they ultimately determine the design of jobs, can enhance or constrain the improvement of working conditions. The appropriate technical decision would consider the effects of technology on workers and the community. The wrong technical decision would trade-in long-term growth for short-term economic advancement.

Under the ILO's International Programme for the Improvement of Working Conditions and Environment (PIACT), a number of national case studies are being carried out to investigate the effects of technology on conditions of work and life in developing countries.

¹ K. Kogi: "Effects of Industrialisation on Working Schedules", in Journal of Human Ergology (Tokyo), Vol. 5, No. 2, 1976, pp. 133-143.

² J. Carpentier and P. Cazamian: Nightwork (Geneva, ILO), 1977.

II. DEFINITION OF TERMS

Given the complexity of the relationship between working conditions and technology it is necessary to provide definitions which are both conceptual and operational. The conceptual definitions facilitate understanding of the theoretical framework while the operational definitions offer concrete "rule of thumb" measures of the terms used. Effort was made so that as much as possible both the conceptual and operational definitions are neutral.

TERMS	CONCEPTUAL DEFINITION	EXAMPLES OF OPERATIONAL DEFINITION	COMMENTS
A. <u>Working Conditions</u>			
1. Working Time	(a) actual working hours including overtime (b) arrangement of working time especially shift and nightwork.		
2. Organisation of Work and Job Content	There are certain important job characteristics which fall under the general category of work organization and job content: (a) characteristics of the operations involved in the job itself including, for example, work pace, the extent of variety in the work, whether the worker inspects his own work, whether	There are many operational definitions of work content. But a simple way is using <u>cycle time</u> since cycle time is related to most factors of job content except for work pace. For work pace, a "rule of thumb" definition is heart rate used in fatigue measures or the time spacing between required motions on the part of the operator of a machine.	This area is well researched by industrial psychologists (ref. Turner and Laurence, 1965; Wild, 1975 etc.) who have developed sophisticated models and a corresponding technical language wherein work content characteristics are referred to as autonomy, "closure", challenge, etc. However, the characteristics mentioned in the conceptual definition <u>is</u> sufficient to illustrate

TERMS	CONCEPTUAL DEFINITION	EXAMPLES OF OPERATIONAL DEFINITION	COMMENTS
	<p>he is responsible for repair and maintenance; the complexity of the work, the extent to which the worker can choose his own tools, equipment and work methods;</p> <p>(b) career opportunities</p> <ul style="list-style-type: none"> - promotion (opportunities for upward mobility); <p>(c) skill requirements</p> <ul style="list-style-type: none"> - amount of training and/or experience to perform the job at specified level of proficiency; 		<p>the meaning of "work content".</p> <p>The relationship between these characteristics and their desirable effect on workers is curvilinear. There is an "optimum" amount of variety, complexity, etc., and too much is just as harmful as an adequate amount.</p>

TERMS	CONCEPTUAL DEFINITION	EXAMPLES OF OPERATIONAL DEFINITION	COMMENTS
3. Working environment	<p>(d) social relations and supervision</p> <p>- the social climate in the workplace.</p> <p>All places of work as well as all the sites and areas where work is carried out including not only the permanent, indoor, stationary places of work but also temporary places of work such as civil engineering sites, open air places such as fields, forests, roads and so on without exception. The working environment has a decisive incidence on the health and safety of the workers as it involves potential occupational hazards as well as stress factors. They include the physical aspects such as microclimate, dusts, gases and vapours, ionising and non-ionising radiations, noise and vibrations, and other aspects related to the potential mechanical hazards pertaining to premises, equipment, lay-out and work organisation; it is now considered that the quality:</p>	<p>Number and types of grievances.</p> <p>In many cases, it is possible to directly measure these aspects with instruments: for example, instruments are available which measure temperature, humidity, the colour and intensity of light, noise, and the presence of certain substances and atmospheric pollutants.</p>	<p>Measurement of these factors should be compared with established threshold limits.</p>

TERMS	CONCEPTUAL DEFINITION	EXAMPLES OF OPERATIONAL DEFINITION	COMMENTS
4. Occupational Safety and Health	<p>of the working environment in the enterprise includes the psychological aspects and the problems of mental health.</p> <p>Occupational safety and health include prevention of occupational accidents and diseases and the improvement of the working environment. This concept therefore covers not only the protection of the physical integrity of the worker and the prevention of occupational diseases but also aims at the promotion and maintenance of the highest degree of physical, mental and social well-being of workers in all occupations.</p>	Sickleave, rates of occupational diseases, accidents and injuries.	
5. Ergonomics	<p>Ergonomics is a multidisciplinary science integrating elements of physiology, psychology, hygiene, technology and other sciences related to work. Its objective (is) the adaptation of the workplace, of the physical and social working environments and of work organisation to the capabilities,</p>	Relevant measures relate to the volume and layout of the work space and equipment, and the quantity and direction of muscular effort required by the job.	

TERMS	CONCEPTUAL DEFINITION	EXAMPLES OF OPERATIONAL DEFINITION	COMMENTS
	<p>abilities, skills and habits of workers. In particular, ergonomics may be considered as having the following major aims:</p> <p>A. To ensure physical and mental well-being, in particular by contributing to prevention of occupational accidents and diseases, reducing physical and mental workload and promoting acceptability of work and job satisfaction.</p> <p>B. To ensure social well-being by improving social contacts and encouraging participation of workers in work organisation.</p> <p>C. To contribute to a rational techno-economic man-machine system, in particular by adjusting the special machine requirements to the functional characteristics of the worker and thereby increasing the efficiency of the man-machine system.</p>		

TERMS	CONCEPTUAL DEFINITION	OPERATIONAL EXAMPLES OF DEFINITION	COMMENTS
B. <u>Technology</u>	: Refers to the whole produc- : tion process (series of : processes) including hard- : ware and software.		
1. Hardware	: Hardware is usually in the: : form of tool, machine or : factories; it is something: : tangible and visible.		
2. Software	: Refers to knowledge, know- : how, experience, education: : and education and organis- : ational forms.		
C. <u>Worker Characteristics</u>			
	: (a) geographical back- : ground;	: Urban/rural.	
	: (b) age;	: Age	
	: (c) education;	: Years of schooling.	
	: (d) training.	: Specialised courses : completed, relevant job : experience.	

III. THE RELATIONSHIP BETWEEN WORKING CONDITIONS AND TECHNOLOGICAL CHOICE

Consider a job. It could be any job, but a common example is that of a typical assembly-line worker in a car manufacturing plant. What does his job entail? In an interview a worker describes his job.¹

My job is to weld the cowl to the metal underbody. I take a jig off the bench, put it in place and weld the parts together. The jig is all made up and the welds are made in set places along the metal. Exactly twenty-five spots. The line runs according to schedule. Takes me one minute and fifty-two seconds for each job. I walk along the line as it moves. Then I snap the jig off, walk back down the line, throw it on the bench, grab another just in time to start on the next car. The cars differ, but it's practically the same thing. Finish one - then have another one staring me in the face.

I don't like to work on the line - no man likes to work on a moving line. You can't beat the machine. Sure, maybe I can keep it up for an hour, but it's rugged doing it eight hours a day, every day in the week all year long.

During each day I get a chance for a breather ten minutes in the morning, then a half-hour for lunch, then a few minutes in the afternoon. When I'm working there is not much chance to get a breather. Sometimes the line breaks down. When it does we all yell "Whoopee!" As long as the line keeps moving I've got to keep up with it. On a few jobs I know, some fellows can work like hell up the line, then coast. Most jobs you can't do that. If I get ahead maybe ten seconds, the next model has more welds to it, so it takes ten seconds extra. You hardly break even. You're always behind. When you get too far behind, you get in a hole - that's what we call it. All hell breaks loose. I get in the next guy's way. The foreman gets sore and they have to rush in a relief man to bail you out.

It's easy for them time study fellows to come down there with a stop watch and figure out just how much you can do in a minute and fifty-two seconds. There are some things they can see and record with their stop watch. But they can't clock how a man feels from one day to the next. Those guys ought to work on the line

¹ C. Walker: Modern Technology and Civilization: An Introduction to Human Problems in the Machine Age (New York, McGraw-Hill Book Company, Inc.), 1962

for a few weeks and maybe they'll feel some things that they never pick up on the stop watch.

I like a job where you feel like you're accomplishing something and doing it right. When everything's laid out for you and the parts are all alike, there's not much you feel you accomplish. The big thing is that steady push of the conveyor - a gigantic machine which I can't control.

You know, it's hard to feel that you are doing a good quality job. There is that constant push at high speed. You may improve after you've done a thing over and over again, but you never reach a point where you can stand back and say, "Boy, I done that one good. That's one car that got built right." If I could do my best I'd get some satisfaction out of working, but I can't do as good work as I know I can do.

My job is all engineered out. The jigs and fixtures are all designed and set out according to specifications. There are a lot of little things you could tell them, but they never ask you. You go by the bible. They have a suggestion system, but the fellows don't use it too much because they're scared that a new way to do it may do one of your buddies out of a job.

How does technology affect his working conditions? We can see that for this worker, and for many like him in traditional assembly line work, the application of the engineering principles of mass production has rendered his job meaningless to him. The conveyor belt determined his work pace. Because the job was broken down to be as specialised, standardised, and simplified as possible, it was highly repetitive and required little or no skill. The tools and work methods were predetermined and if changes were made, it was the engineer who controlled it. He worked on a minute part of the product and never got a sense of the whole. Since differences in skill were more or less eliminated, he finds it difficult to see any opportunities for promotion.

Consider another job. In a small foundry, one common and necessary job relates to semi-finishing of castings. This is done by grinding the casting with one of several different types of machines depending on the size of the mold. If the casting is huge the worker uses a portable grinder, while if it is small he carries the casting near his equipment. In both cases, problems related to noise (from his own operation and noise from others near him), vibration, awkward body position, weight of equipment and/or casting, dust (sand causes silicosis), safety (e.g. machine guarding), heat, etc. are critical.

From these examples we can see that hardware chosen solely on the basis of technical engineering criteria greatly determined the nature of jobs. In so doing, many working conditions were also determined. In the assembly line job, the conveyor belt determined many aspects of work organisation and job content - work pace, variety, responsibility in choice of tools and work methods, complexity of the job, skill requirements, possibilities for social interaction and career opportunities (refer to table). Whereas, in the foundry job, the adverse physical working conditions related to safety, noise, vibration, dust, heat, design of equipment, etc. can be traced to the particular equipment used. Thus, to the extent that technology, especially hardware, influence the link between the worker and what he does, technology influences working conditions.

To emphasise the relationship between technology and working conditions, we have focused exclusively on the impact of hardware on particular jobs and its consequent working conditions. However, technology, jobs, working conditions and the relationships among them are more complex and dynamic than this.

First, if we define technology as the total production process, including hardware and software, each process involving a different activity, set of skills and (usually) machinery, it is apparent that the series of processes entail a corresponding set of jobs. For example, a production process may include purchasing, milling, drilling, welding, assembly, testing, painting and dispatch with corresponding jobs of buyer, driller, welder, assembler, tester, painter and dispatcher. Thus, it is more appropriate to visualise the production process as an interdependent system of related processes, methods, tools and equipment and their corresponding jobs rather than in terms of "a technology of an organisation". Using this systems approach alerts us to the fact that efforts to improve working conditions for one job may result in the downgrading of working conditions in another. And it enables us to identify critical decision points to improve working conditions and widen the range of viable technological alternatives.

Secondly, partly due to changes in technology itself and the high rate of technological change, it is increasingly evident that technology is neither unalterable nor deterministic. In other words, there are choices to be made! Going back to our assembly-line worker, is it necessary that such a job exists? No. Automobile assembly plants have been designed so that workers can assemble a major part of the car or work in teams. This means that the "technology" of car assembling does not determine particular jobs, though it apparently does constrain the available choices.

There are, in principle, numerous technological choices in producing a product, achieving a technological objective or organising work.¹ Though there may indeed be only one way if technical decisions have been made. Obviously, once a product has been rigidly specified, the production facility built and the machinery installed, any attempt to achieve meaningful jobs is severely constrained. For example, an organisation that has huge investments in stationary equipment which has little operational flexibility may find it extremely difficult to identify ways to change the jobs of its machine operators. (That job design considerations might have been brought into the picture when the equipment was designed is an issue of considerable significance - but, unfortunately, not one about which much can be done after the equipment is in place.) Technical decisions therefore can enhance or constrain the potential to improve working conditions.

An examination of the constraints which derive from technical decisions requires a look at the decision-making process itself.

For this paper, we will focus on three major stages of decision-making - product choice, product design and production facility design. Although these three stages imply some sort of sequence the distinction among them is arbitrary. For example, a technical decision concerning product choice may include technical decisions concerning product design and/or production facility design while technical decisions concerning product design may incorporate technical decisions regarding production facility design. The three stages can best be viewed as continuum wherein a technical decision at one point constrains future choices at a later point. Therefore, we will look at some working conditions that result directly from a technical decision made at a particular stage as well as those that flow or can be linked to the next stage (i.e. constraint to technological choices and decisions at the next stage). This examination will show that before the worker-job relationship (and therefore working conditions) is specified there is a wide range of technological choices and a whole series of decisions to be made. The design of jobs with good working conditions is best viewed as a consequence of prior choices.

The hardware and software employed in any industry are partly determined by the products produced. The decision to make these products results from economic and political

¹ L.E. Davis and A. Cherns: The Quality of Working Life: Problems, Prospects and the State of the Art, Vol. 1 (New York, Free Press), 1975.

decisions. At the most general level, these products fall into certain demand categories. The more broadly these demand categories are specified, the wider the variety of products that will fulfil them. For example, if the demand category is taken to be clothing with no other specification, a wide range of products are available. Thus, constraints to obtain good working conditions are theoretically non-existent or at most minimal. However, in practice, the demand will include some characteristics (general specifications) which lead to product choice.

Product choice

This is the first stage of actual decision-making. Although there is a thin line between product choice and product design, a distinction between the two is necessary since the focus of decision-making is different. While engineers are the most influential group in determining product design, national planners have a vital role in determining product choice. In their policies influencing demand and the development of certain industries and sectors, they explicitly or implicitly are making technical decisions concerning product choice which may have far-reaching implications. If in response to the demand for transportation, a technical decision to make cars is made it is likely that due to financial constraints, one can already foresee working conditions problems related to traditional assembly-line work (it is unlikely that developing countries will build another Kalmar!), shift work, safety and health (noise, heat, vibration, work-load, stress, etc.).

It should be noted that if the product is so finely specified, then it is possible that only one process may be feasible. On the other hand, there are different ways of making shoes, different types of cars, houses, etc., to be manufactured.

Within a wider context, product choice has direct bearing on policies regarding technological dependency, indigenous technology and balanced socio-economic development. For example, given a choice between establishing an agricultural equipment workshop and a cement plant, it is apparent that the agricultural equipment workshop offers more potential for training and skill development, local adaptation of foreign designs (and eventual local designs), decentralisation (local manufacture of spare parts) and cultural adaptation of working and family life.¹

¹OECD Development Centre: Appropriate Technology: Problems and Promises (Paris, OECD), 1976.

Product design

Once a product is chosen and its characteristics specified, the range of viable technological choices are altered if not constrained. For example, a car can be designed according to a stylistic model used in industrialised countries or functionally designed for utilitarian purposes. An example of the latter is the "sakbayan" ("vehicle of the masses") in the Philippines which has a smaller less powerful engine and whose chassis, having a minimum of accessories, is made by simply bending and welding steel sheets. One type of car design, because of its rigid manufacturing standards, entails a less flexible production process (especially hardware) which minimises possibilities for job design with good working conditions. The simpler model, on the other hand, because of its less elaborate and precise manufacturing process, imposes less technological constraints for technological decisions concerning working conditions. Similarly, clothing can be made from synthetic or natural fibres. A UNIDO/UNEP case study (19 June 1975) on the textile industry in Thailand showed that the manufacturing of synthetic materials led to respiratory disease caused by the inhalation of dust (composed of minute fibres of synthetic material) and vapour (from urea and aldehyde resins); and dermatitis caused by handling the fibres (synthetic fibres can perforate the skin) or chemicals used to condition, dye and finish the yarn or fabric.

In the agricultural sector, the variety of rice chosen has important implications for working conditions problems related to workload, body posture, the use of roller mills or hand/hammer pounding, and the use of pesticides.¹

From these above examples, we can see that technical decisions concerning product design has important direct ramifications for working conditions as well as for later technological choices.

At this stage, engineers become important decision-makers since product design and the technical management of its manufacture are usually their responsibilities.

¹ ILO: Choices of Technology and Working Conditions in Rural Areas, Paper submitted by A. Manuaba to the Philippine National Tripartite Conference on Improving Working Conditions and Environment, Manila, 12 to 14 December 1977 (Geneva; mimeographed).

Production facility design

Once the product is designed, a production facility must be designed and built. Although product choice and design have substantially constrained subsequent choices, there are still technical decisions to be made at the production facility design stage that can effect good working conditions. In fact, most job design or humanisation of work experiments have been carried out at this stage.

(a) Production facility at design stage

If the factory is still at the design stage, working conditions can be incorporated in the design criteria. This allows more opportunities, i.e. technological choices to ensure well-designed jobs and consequently avoid future expensive remedial measures. At this initial production facility design stage, ergonomic principles related to physical working conditions such as climatic differences, lighting, ventilation, noise, machinery lay-out, anthropometric characteristics of workers and safety and health can be considered. With regard to organisation of work and job content, technical decisions concerning how work should be distributed and organised (job design for individuals or for interacting groups), work flow, pace, level of mechanisation and/or automation, hours of work, shift and nightwork, rest pauses, part of the product done by the group or individual, degree of shopfloor participation in decision-making, potential for on-the-job training and skill development, leisure facilities, etc., can be made.

A design strategy which takes into account these factors is the "socio-technical systems" approach. The basic idea behind this approach is that any production system has two fundamental dimensions - a technical system (equipment, work process, physical layout) and a social system (social relationship among those who perform the job). These two systems are integrated and mutually supportive. Corollary to this idea are the following two assumptions:

- (1) technical systems incorporate social system choices, i.e. social system requirements are intentionally or accidentally designed into technical systems; and
- (2) the socio-technical system is embedded in a socio-cultural environment.¹

¹ Davis and Cherns, op.cit.

If we closely examine the application of technology to work organisation at the design stage, we find that not only does the technical design influence social system design and behaviour - but that the technical system design includes social system design. When a technical system is designed it carries with it psychosocial assumptions about man and work. This means that contrary to common belief, technology is not predetermined by its own developmental "laws" or inherent logic (technology is not deterministic). Instead, technology is substantially determined by the psychosocial assumptions of its designers. Once these assumptions are designed into the technical system, the resulting jobs conform to the prophecy implied in the design. For example, if the designers' underlying assumptions are that workers are lazy, indifferent, unreliable and motivated only by economic incentives, then the technical system design will consider them as "replaceable machine parts" to be controlled by the technical system or by strict personnel supervision. On the other hand, if the designers' assumptions are that workers are reliable, self-organising and capable of work commitment, then the technical system will require that they perform responsible, meaningful jobs.

Unfortunately, failure to understand the implications of technical system design has led to a division in the design process itself with the technical system design solely with the engineers and the social system design with managers and "organisation specialists". This division of responsibilities has allowed the technical system design to dominate and fore-close options to design jobs with good working conditions, and to maintain those psychosocial assumptions that developed more than a century ago.

Moreover, the same technical system will operate in radically different ways depending on the people who work there and their socio-cultural background. Therefore technology with its associated work organisation superimposed on a different socio-cultural system is likely to have negative consequences on both the work system and the community unless a planned effort is made to deal with these consequences.

Significantly, the "socio-technical systems" approach provides, if not necessitates, a multi-disciplinary approach to the design process. This ensures that both the technical system and the social system are equally considered. Such a joint systems design has the potential not only to generate technological alternatives with more choices in social system designs but also to specify and incorporate social system criteria as requirements of technical system design.

It is apparent that engineers have a key role in the design process. However, the current preparaton and practice of engineers require a reconceptualisation of man's role in the production system. This entails rejection of the

conventional view of the technical system as inviolable together with all its concomitant psychosocial assumptions. Industrialised countries are now experiencing the costs and diseconomies inflicted by the choice (or non-recognition if there was a choice) of industrial technology based solely on engineering principles. For developing countries, the problems are exacerbated. Not only are engineering courses rooted on the narrow assumptions of traditional engineering but also on a totally different cultural environment.

Thus, the potential to improve working conditions at the design stage is great. For example, in the Final Report¹ on the study of the effects of group production methods on the humanisation of work, Burbidge notes that "there appears to be no technological limitation to the use of group production methods". Classifying products into components (discrete items such as forks, drills, casting, etc.), bulk materials (quantity measured in units of length, volume, area or weight such as wire, steel sheets, chemical products, sugar, rubber, etc.) and assemblies (items produced by joining components together such as machine tools, furniture, television sets, etc.), he shows that all the different group production methods are in use in the production of all the types of products listed above. This finding, based on a survey of 189 companies throughout the world, is a powerful demonstration of the lack of technological constraints in the use of group production methods in particular, and of the flexibility of the technical system in general.

(b) Production facility is already built

If a production facility is already built and the machinery installed, technological choices to improve working conditions are further limited. Since at this stage technical decisions focus on changing an existing situation (i.e. restructuring or redesign), the extent to which change is possible depends on such factors as the design of the product, the cost of existing equipment and its operational complexity and flexibility, and the amount of money the company is willing to spend on the change. In fact, in some cases due to the extremely expensive equipment, only minor modifications can be made.

¹ John L. Burbidge: Final Report on a Study of the Effects of Group Production Methods on the Humanisation of Work, Report prepared under contract to the International Labour Office by the International Centre for Advanced Technical and Vocational Training (Turin), June 1975.

The physical working environment including such factors as noise levels, vibration, atmospheric pollution, heat, exposure to dangerous substances, is in many cases the result of the overwhelming influence of existing equipment. For example, most existing blast furnaces require, in order to be operated, workers to be exposed to extremes of temperature and fumes which cannot usually be eliminated without major and expensive modifications. Another common example in developing countries is a textile mill, where the elimination of dust would require major changes to spinning and weaving equipment.

Under these circumstances, recourse is frequently had to remedial measures such as masks, protective clothing and other measures which do not alter the basic nature of the problem. Such remedial measures often create problems themselves or are not adopted by the workers.

Concerning work organisation, much of the research in industrialised countries has concentrated on improvements using existing facilities. This includes research and experience regarding job enlargement, job enrichment, job rotation, etc.

An example of this is a study on the scope for change in mass production.¹ It was found that by allowing the workers to move along the line, using buffer stocks to increase cycle time, shorter assembly lines and adding auxiliary tasks such as inspection can result in some variety and worker responsibility on the job. However, it should be noted that in heavy assembly, the job is greatly defined by the expensive equipment that surrounds the work station and changes in equipment are very costly.

The constraints posed by expensive equipment are even more apparent in the chemical and process industries. For example, in petroleum refining, the amount of capital investment per worker is so huge that only peripheral changes, i.e. remedial measures versus radical equipment change can be realistically implemented.

However, in low investment assembly where production is usually in batches and the technology simple, elimination of the assembly line can often be offset by increased operational flexibility, improved quality and better working conditions.

Therefore, once a production facility has been built, there is a striking reduction in the available technological choices, or, in other words, a striking increase in the constraints preventing good working conditions.

¹ Ray Wild: Work Organisation (London, John Wiley and Sons), 1975.

Cutting across the decision-making levels described above, there are a set of considerations which also limit choices. As previously noted, product choice is often the result of political and economic decisions. These decisions often reflect trade-offs between a particular society's development goals and priorities and the restrictions imposed by such factors as the patent system, the cost of equipment, the demands of the international market, the lack of available knowledge concerning technological choices and their consequences, and the weak information or communication system in developing countries. Further, these decisions also influence product design and production facility design in ways analogous to those concerning product choice. The details of these influences are beyond the scope of the present discussion. However, certain factors are sufficiently close to our concerns to merit a brief look. These are scale, quantity and quality of production.

Scale refers to size of the plant or production facility. Some methods of production require large-scale plants to operate efficiently (e.g. steel manufacturing) while other processes may be carried out efficiently in small plants. Scale has important implications for working conditions because large-scale production frequently entails a rigid complex bureaucratic structure and presents technical constraints due to the sequential interdependence of operations. It is interesting to note that in large-scale enterprises there is often a "strenuous attempt to attain smallness within bigness".¹ For example Kalmar and General Motors have attempted to create small workshops within large plants. Moreover, large-scale plants tend to encourage concentration of industries in urban centres, with consequent economic and sociological implications of migration of workers to cities and the need of provision of housing and other social facilities.

A second factor, closely related to scale is the quantity of products to be manufactured. Quantity is relevant because its specification influences to a great extent scale and the method of production feasible. For example, it is unlikely that simple backyard operations can meet the production target specified for national and export market of shoes.

A third factor concerns the quality of the product. Differences in quality is in most cases tantamount to differences in product which therefore entail the application of different production processes with all its attendant implications for working conditions. For example, the production processes differ between making sophisticated faster cars and simple functional ones, between making synthetic fibres

¹ E.F. Schumacher: Small is Beautiful: Economics as If People Mattered (New York, Harper and Row Publishers), 1973, p. 64.

and natural fibres, between making a high powered versatile tractor and equipment designed by the International Rice Research Institute of the Philippines.

IV. ADAPTATION

Most technological processes are developed in industrialised countries. Therefore, the choices available to developing countries do not always include hardware and software appropriate to their local conditions and needs. There is, consequently, a need to develop or adapt technologies in addition to those "on the shelf". This means that in fact there are two issues: the selection of technology which already exists outside the country, and the adaptation of this technology to the local situation. Moreover, there is a third source of technology in developing countries that in a sense is already both selected and adapted: indigenous technology developed through local innovation.

Assuming that the technology is imported from abroad, it is usually adapted in one way or another. Adaptation implies change to accommodate the constraints and minimise the negative consequences of technical decisions. It can occur through modifications in the technical system or the social system or both. Products can be chosen and/or redesigned to encourage particular production processes and linkages with other products to meet local economic priorities. An example of technical system adaptation would be modifications in peripheral or ancillary operations (e.g. packaging, dispatching, etc.) in a production process to obtain well-designed jobs, even if the core technology is inflexible. Other technical system adaptation examples such as the application of ergonomics, the improvement of physical working environment, etc., were noted in the above section on redesign after a production facility has been built. Examples of social system adaptation are training of workers on-the-job or establishing training centres, choice of location and decentralisation of industries, building of social facilities, etc.

Worker-job fit

The center of any study on working conditions should be workers. However, thus far, we have been talking about jobs as if there were an average worker for whom an ideal job could be designed. In fact, workers differ. They differ in their physical attributes, personal needs and goals, cultural values and traditions, expectations, skills and abilities. Moreover, these differences vary over time. Individual differences

have crucial implications for adapting the technical system to the worker and vice versa. To a great extent, the degree of congruence or fit between the people who do the work and the work itself determines working conditions.

On the most obvious level, workers vary in human physical dimensions and capacities (height, weight, size, tolerance for heat or cold, tolerance for physical stress, etc.). Thus, a tool, machine or workplace, should be designed to suit the people who will use it. A chair or workbench designed for an average European may be too high for an average Asian. A safety device installed in a drill press cannot function because the anthropometric dimensions of the worker cannot reach it. A sickle for harvesting in Western countries may be too heavy or require awkward posture for an Asian farmer. Moreover, in considering physical human dimensions and capacities, it must be remembered that not only do workers react differently to different situations, but that they react differently to the same situation.

Ergonomic consideration of human physical dimensions are important not only for the comfort of the worker but also for productivity. Because people are adaptable, and they can cope somehow with all but the most impossible arrangements, management tend to be unaware of the price they are paying for this adaptability. Since a person only has limited work capacity, what he is using to overcome aspects of the tasks which have been made unnecessarily awkward is really spare capacity which could be available to prevent accidents, and to maintain quality and productivity. Also, proper adaptation can bring the work within a greater range of people (e.g. older or handicapped workers).

Since most developing countries import their equipment or its design from industrialised countries, adaptation can pose problems. Indeed, ergonomics may be more crucial for developing countries where work is more labour-intensive.

In addition to physical differences, workers also vary along psychological dimensions which they bring to the job. These differences derive partly from different work experiences as well as from more basic differences in personality, values, life styles, social class, and family and educational backgrounds. The important fact to recognise is that not all workers want enriched jobs, greater challenge, more responsibility, a promotion to management or an opportunity to interact with other people on their jobs. Because some workers are more concerned with financial rewards and job security, prefer simple routinised jobs or prefer to work alone should not automatically be construed as an indication that they are "unhealthy or immature" individuals, or that their quality of working life is poor. This is a value judgement that will not be made here. It is important to remember that working

conditions, especially work organisation and job content, should be assessed in terms of the workers', rather than the manager's or researcher's value system. However, the fact that such differences exist must be recognised and dealt with in any attempt to improve the quality of working life for a diverse group of workers.

Perhaps the most important factor of how a person reacts to a job is the level of knowledge and skill he or she has to perform it. When a worker's skills and abilities do not match his job, serious problems develop for both the worker and the employing organisation. It is often thought that it is necessary to design jobs which use a minimum of skills to "match" the available labour force in developing countries. However, most jobs designed to correspond to very low skill levels consist of repeated gestures (e.g. in assembly lines) or mere muscular effort (e.g. manual excavation for construction projects). In the long run, such jobs are counterproductive because they do not lead to the development of useful skills and greater productivity. Moreover, the frustration which results from such jobs is closely associated with absenteeism, turnover and poor quality products.

Of course, a reverse problem is overqualification of workers. Overqualification can represent as much a mismatch between job and person as lack of skills and abilities. Overqualified workers are likely to find themselves unchallenged by the work and bored with it.

Certain additional worker characteristics moderate the relationship between the worker and the job. These are age, sex, education and culture.

Age is relevant to worker-job fit especially with respect to (a) the lessened adaptability of older workers as a function of biological changes coupled with the need for them to adapt to the technology itself; and (b) the changing values and expectations of young workers due to more and better education.

Women have traditionally been assigned jobs which were supposedly adapted to their particular abilities and community roles. These jobs - mostly involving manual dexterity - are becoming less and less appropriate to women who are better educated, who have higher expectations and who are increasingly called upon to take new roles in society. For example, women are frequently employed in sorting, packing and other routine jobs concentrated in the textile, clothing, tobacco, food and similar industries.

Education also changes expectations and skills which the worker brings to the job. Even where manpower planning has produced the necessary supply of skill mix, there remains

the need to educate and train people about the actual work situation which may be significantly different from experience in educational institutions.

Finally, worker characteristics are also influenced by culture. This is particularly important since the technology which is exported from industrialised countries is designed with a particular set of values and attitudes toward work. In many cases, these values and attitudes are different in developing countries. For example, one author¹ points out that "societies form different cultural norms about 'my work' or 'your work', about who may appropriately be included or excluded from work groups, and about work structure that conform most accurately to existing societal pecking orders. Moreover, cultures also differ in a variety of work practices, including: (1) appropriate amount of work; (2) time periods allotted for work - continuously, infrequently (seasonally), almost never; (3) the pacing or rate of work - steady daily effort or short periods of concentrated effort, or machine versus individual pacing; (4) activities that may accompany work - talking, singing, socialising; (5) whether work is done in private or in public; and (6) appropriate work for a person's age and sex."

It is therefore apparent that what is a "good" job depends substantially on worker-job fit which in turn is a function of both the characteristics of the worker and the characteristics of the job. Although a "perfect" match is somewhat idealistic, there are usually two ways of improving worker-job fit once the technology is in place. These are personnel selection procedures and training.

Personnel selection is essentially evaluating, in terms of the requirements of the job, the capacities of those persons who are candidates for it. The limitations of such procedures are that they tend to encourage practices inconsistent with the attainment of a good match between workers and jobs. For example, one problem is that jobs will tend to be filled by people who receive the highest scores on selection tests - people who are often considerably over-qualified for the job. A second problem is that the job requirements themselves (which are taken as "given") often include problems - repetitive work, noise, etc. - which cannot be solved by selection, especially in the long run.

Training has many of the same functions and limitations as selection. While it is obvious that training has numerous positive aspects, for the purposes of this paper, it is necessary to point to one of its limitations: to what extent can

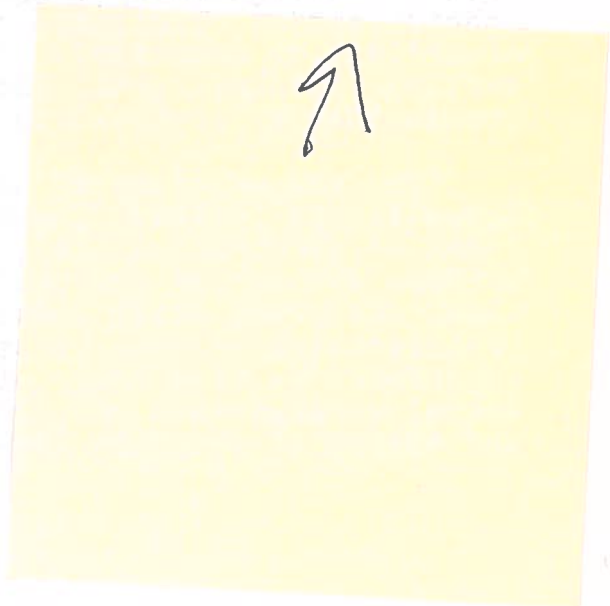
¹ H. Triandis: "Work and Nonwork: Intercultural Perspectives", in Work and Nonwork in the Year 2001 (Monterey, California, Brooks Cole Publishing Company), 1973.

training overcome or compensate for poorly designed or chosen technology? For example, how can one train a worker to cope with repetitive work or alienation?

In summary, the above discussion emphasises the need to take into account both worker and technological variations in adaptation. It implies that efforts to increase worker-job fit via selection and training are often undermined if the technology itself is poorly designed in terms of worker characteristics and local conditions.

Indigenous technology

Although many technologies are imported, indigenous technologies offer an opportunity to improve working conditions which is frequently not recognised. Indigenous technologies are not only adapted to local conditions in the use of local raw material, but also allow the worker to participate in the design of his own job. The organisation of work, the arrangement of working time, the division of labour, have evolved in response to local conditions, skills customs and preferences. Specific policies should be formulated to encourage the development and protection of indigenous technology.



V. AGRICULTURE AND RURAL AND SMALL-SCALE INDUSTRIES

The relationship between working conditions and technology in agriculture and rural and small-scale industries contains some parallels with large-scale industries, but the different social and cultural context and the radical differences in the technologies most commonly found require a separate discussion.

In the rural and informal sectors, the socio-cultural system is a dominant force affecting all aspects of a worker's life. By and large, it defines who he is, what he is to do and how he is to do it. Relationships among people, whether based upon kinship, neighborhood or friendship are greatly characterised by shared values, sentiments and beliefs. The social order based on consensual folkways, mores and religion orient a person's activity toward the community. The development of individualism is minimal.

In most cases, the family is the basic unit of production. Equipment is limited to simple human or animal powered implements. Work is sequential and the worker carries the product through every stage of production. This lack of specialisation eliminates the need for any significant co-ordinating activity. Production techniques requires simple skills. Technological knowledge and work competencies are transmitted by observation and learning by doing.¹

The introduction of new technology causes dramatic transformation in individual and community lives. Power technology (such as electrification), transportation technology, agriculture technology and production technology result in, inter alia, different skill requirements, occupational specialisation, proliferation of new occupations and formal organisations, less dependence on vicissitudes of nature, questioning of traditional social arrangements and authority, and changes in the meaning and nature of work and non-work.

¹ Peter Kilby: "Farm and Factory: A Comparison of the Skill Requirements for the Transfer of Technology", The Journal of Development Studies, (London, Frank Cass and Co. Ltd.), Vol. 9, No. 1, Oct. 1972.

Due to the inter-relatedness of all aspects of life and the poverty in these sectors, the introduction of new technology with all its associated values, work organisation and complexities, causes considerable strain and conflict. Perhaps, more than in the urban sectors, second, third and higher order effects (unplanned or unforeseen) of technology become evident as the people attempt to adapt and cope with the challenges of change. For example, although electrification is introduced by governments according to preplanned objectives, it also results in longer hours of work, and increase in shift and night work.

Thus, without discounting the beneficial influences of technological change in the rural sector, let us look at some of the working conditions issues that are becoming increasingly relevant as technology is diffused.

Working time

It is obvious that working time is greatly influenced by technology. Although the maximum hours of work are usually specified by mutual agreement between employers and trade unions or by government legislation, these are often not effective deterrents or viable solutions except in large plantations where the workers are more organised and trade unions exist. Moreover, as experience has shown, enforcement is a problem. To a farmer what is important is how he can compensate for a costly tractor or how soon he can harvest and market his crops to make ends meet. Thus, in agriculture and in small undertakings, the cost of equipment can militate against shorter hours of work.

In some cases, mechanisation and extensive use of fertilisers and pesticides have indeed reduced hours of farming work.¹ But this has been offset by an increase in hours in side jobs so that in fact the total hours of work became even longer. Thus, while agricultural mechanisation has increased productivity, it did not solve but instead aggravated the problems of long hours and fatigue. Expectedly, there has been a corresponding increase in accidents. Professor Manuaba cites similar examples for both men and women workers in Bali.²

Thus, in the rural sector, the determination of working time and its consequent effects on workload, fatigue and accidents should consider the wide range of activities engaged in by the particular worker.

In small-scale manufacturing workshops, long hours of work is also the rule more than the exception.

¹ K. Inoue: "Changes of Working and Sleeping Hours of Farmers in Accordance with Technological Innovation in Agriculture" in Journal of Human Ergology (Tokyo, University of Tokyo Press), Vol 3, No. 2, December 1974, pp. 131-142.

² Manuaba, op. cit.

Working environment

Technical variables influence the tangible conditions of the workplace: noise and vibration, lighting, temperature, chemical and other occupational hazards, dirtiness, arduousness of the task, and atmospheric pollution. In part, optimal physical working conditions are achieved through application of ergonomic specifications in the adaptation of technologies to the characteristics of the workers. For example, the arduousness of the task can be minimised if the equipment and the workplace are adapted to the human physical dimensions of the worker.

It is widely known that extremely poor physical working conditions are common in small-scale enterprises and workshops ("sweat shops"). They exist in ceramics and brick-making industries in Bali, the scrap lead smelters in India, the slaughterhouses in the Philippines, the grain-milling plants in Burma, etc.

In a survey of small foundry workshops in Japan¹, it was found that a higher degree of mechanisation did not solve many working conditions problems. Dust concentration in the moulding shops varied between 3 to 38 mg/m³ while in the finishing processes measurements reached 300-400 mg/m³ level. Exposure to noise was significant due to accelerated mechanisation. Lighting was usually under 100 lx. Poorly designed workspace resulted in unnatural working postures and constant exposure to dust, noise and heat. The author notes that, from a working conditions point of view, the appropriate design of jobs should focus on practical means to reduce environmental hazards and excessive work demands which may not necessarily include higher mechanisation. Since workers are often necessary to handle the non-mechanical part of the production process, the workplace should be arranged to minimise the risk of hazards for the workers and to make allowances for them.

Occupational safety and health

In the agricultural sector, safety and health problems related to technological change directly concern the use of agricultural chemicals and the operation of agricultural equipment and tools.² Certain levels of exposure to insecticides, fungicides, herbicides and similar products have been found to endanger the health of workers. In most cases,

¹ S. Horino: "Major Workshop Problems in the Foundry Industry" in Letters to the Editor of Journal of Human Ergology (Tokyo, University of Tokyo Press), Vol.4, No. 2, 1975, p. 181.

² ILO: Social Consequences of Technological Development on Plantations, Committee on Work on Plantations, Sixth Session, Second Item on the Agenda (Geneva), 1970.

the problem lies in the lack of safety precautions due to inavailability of protective masks or ignorance. With respect to the operation of tractors and other agricultural tools, accidents can occur due to unfamiliarity with the machine or tool or poor ergonomic design.

Of course, many higher order effects of technology on safety and health can be traced to the length and arrangement of working time, workload and the current state of health of the worker.

Just as physical working conditions are worst in small-scale industries and workshops, it is logical that safety and health problems are also critical here. Since these industries suffer from chronic economic constraints, safety, sanitation and hygiene are often considered the least of their worries. Many use dangerously improvised old equipment (new ones are too expensive), machines without guarding, or old methods and limited equipment which make the work more arduous. Of course, environmental working conditions are generally poor and hazardous, especially since personal protective equipment are usually not available.

Work organisation and job content

Since technology does not mean merely equipment but a whole network of institutions, values and work methods, its introduction in the rural sector has significant consequences.

The introduction of irrigation, new varieties of rice, the shift from human to animal power and to improved tools and tractorisation coupled with land reform and the establishment of infrastructures such as rural banks credit facilities and co-operatives, electrification, roads, etc. change the organisation and content of work in the agricultural sector. In small-scale industries, the introduction of more complex production processes and different work practices brought analogous, if not, more dramatic changes. Moreover, the transplantation of a large-industrial complex in a rural setting has far-reaching implications on the existing socio-cultural and economic systems. In these cases, the family was no longer adequate to cope with the new tasks. Traditional practices often can no longer be depended on to provide guides to action. A distinction between work and non-work became apparent.

The effects of technology on work organisation and job content can be vividly seen in the changes in skill requirement, the proliferation of new occupational roles (occupational specialisation) and formal organisations, changes in work practices and in personality and attitudinal orientations toward work.

One of the initial consequences of the introduction of technology in the rural sectors is the increase in new roles and occupational specialisation. A striking example of this is the implantation of a large textile factory in a rural town in Guatemala.¹ Prior to the implantation there were only 22 occupations of which a significant number was involved in agriculture. After the establishment of the factory, the number of occupations increased by 125 per cent. Moreover, some of the non-technical skills disappeared in the transition.

Organisations with their rules and expectations also gradually specify the range and limits of a worker's behaviour as they increasingly take over the functions formerly held by the kinship system and informal relationships.

The growth of new work roles and organisations correspondingly called for workers with different qualifications and specialised tasks. Machine operators, maintenance and repair specialists were now required in agriculture. While in small-scale industries, the new tools and work process necessitated different skill requirements. The farmer himself also had to learn the various techniques in growing the new varieties of crops while the small entrepreneur had to become knowledgeable about management production methods. In many cases, however, these new tasks involved reduction in skill requirements and responsibility.

VI. MEANS OF ACTION

Particular working conditions are consequences of prior decisions about choices of technology. Consequently, means of action are aimed at decision-makers who share the responsibility and perform crucial roles in bringing about the improvement of working conditions at each point where key choices are made. As previously analysed, these decisions take place in the stages of product choice, product design and production facility design. At each of these stages, different decision-makers are important and different interventions are required.

Decision-making stages

National planners have a primary role in the making of technical decisions concerning product choice. They can formulate economic policies which influence demand for certain products, they can promote the development of new products and they can establish infrastructures which directly or indirectly

¹ Chandler, Morse et al.: Modernization by Design: Social Change in the Twentieth Century (Ithaca, Cornell University Press), 1969.

determine product choice. In addition, product choice is also greatly influenced by consumer preferences, entrepreneurial decisions and research developments.

Product design is the initial stage at which engineers intervene and detailed decisions about the production process are made. Engineering decisions continue to play a major role during the design of production facilities. Working conditions problems in production processes are not problems of "man versus machine, but rather of man versus man - man, the user and operator of machines, versus man, the designer of them."¹

Moreover, since we have argued that social factors should be taken into consideration as early as possible, there is a need to enable the representatives of the workers, the trade unions, to fully participate in decisions which will ultimately affect workers.

What steps, then, should be taken to influence these decision-makers, and what should be the content of change?

The content of change

The basic areas in which technology influences working conditions and environment have been described above. However, these areas do not constitute a strategy for action. The initial step in establishing such a strategy is the development of an assessment methodology which permits the accurate evaluation of the potential of various technological alternatives to improve working conditions.²

The next step is the inclusion of this information in training and information dissemination programmes for various categories of decision-makers.³ This information and training will overcome the biases of particular disciplines and will promote consideration of social, in addition to technical, aspects of the workplace. For example, engineers will be better able to incorporate the development of industrial skills as a design criterion. Or managers, aware of the potential cost of poor working conditions related to particular technological alternatives, will formulate company policies and practices which reflect concern for the well-being and development of the worker. Trade unions would be enabled to evaluate the effects on workers of various technologies and therefore adequately represent them.

¹ A. Chapanis: "On the Allocation of Functions between Man and Machines" in Psychology and Industry (London, The Macmillan Co.), 1970, pp. 423-433.

² ILO: Choice of Technology and Working Conditions: A Social Assessment Framework, Paper submitted by B. Koppel to the Philippine National Tripartite Conference on Improving Working Conditions and Environment, Manila, 12 to 14 December 1977 (Geneva; mimeographed).

³ ILO: Information and Training Needs for Choice of Technology and Working Conditions, Paper submitted by A. Wisner to the Philippine National Tripartite Conference.

At the international level, decision-makers (be they governments, managers, or private financiers, etc.) can see to it that the technologies imported or rented from industrialised countries are adapted to the characteristics of the worker and the local situation and are not based on psychosocial assumptions which lead to dehumanised work in the long run.

Moreover, although importation and imitation of technology from industrialised countries must and will play a major role in development, these must eventually be supplemented and complemented by indigenously-oriented innovation if sustained growth and technological independence are to be achieved.

The relationship between working conditions and technology is as yet at a preliminary stage of investigation. While the conceptual information and examples presented above constitute, hopefully, a demonstration of the importance of the question and an indication of the direction further work may be expected to take, there is still insufficient information concerning specific sectors and possible means of action. The ILO's own case studies have been undertaken on a pilot basis and there is a need for more extensive investigation. However, this should not be an excuse for failing to exploit fully the knowledge we already have concerning the potential to improve working conditions through technology.

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Information and Training Needs for Choice
of Technology and Working Conditions

by

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1.0 INTRODUCTION

Working and living conditions depend on numerous decisions taken in every country by all kinds of authorities for a wide variety of reasons. On the conditions thus determined the country's immediate future will be built; they are the foundation of its economic and social progress.

Twenty years ago it was generally accepted that all countries of the world could easily be classified according to the single criterion of per capita revenue. This was taken to be the essential - perhaps the only - gauge of economic and social success. Thus the most industrialised countries were taken as a standard of comparison for all the others.

But Gross Domestic Product (G.D.P.) and its offshoot per capita G.D.P. are only an index of commercial activity - an imperfect index even in an industrialised country, ignoring as it does the economic activities of mothers and (largely) of old-style farmers. It becomes grossly inaccurate in countries not yet fully industrialised, where non-commercial economic activities linked to the traditional system are still by far the most common. Describing economic developments in terms of per capita G.D.P. thus tends to ascribe too much importance to greater commercial production and hide any fall that may take place in non-commercial production at family or village level; it tends, that is, to highlight the advantages

of industrialisation to the national economy but not the harm it does to the life of the individual.

As industrialisation spreads throughout the world it becomes clear that assessing its effects is an extremely complex matter. Some countries have reached a very high G.D.P., but signs of social dissatisfaction in them increase and multiply as old production systems break down or new ones turn out to be less perfect than they looked at first. In other countries economic growth benefits only a minority - the middle classes, or more generally speaking, town dwellers. All too often the peasants - who are still three-quarters of the population of the world - lead a no less miserable existence than before, or are still further impoverished.

The very way in which industrialisation takes place is often questioned. Some countries give priority to heavy industry; in the long run it leads to economic independence, but often at the price of crushing indebtedness which in the short run keeps down the levels of living of most of the urban and peasant population. Other countries welcome foreign investment in their agriculture and industry. It produces goods which have little relation with what the country most needs, but puts large sums in the public purse. In agriculture priority sometimes goes to immense plantations financed by national or foreign capital, because they give the country a share of world trade, and sometimes to co-operatives, whether old-style or modern, producing food crops which provide the country with an adequate supply of good quality food.

This paper is not concerned with such questions. They are serious economic matters and each country deals with them as its history and future prospects suggest. But - and this is important - to a great extent they determine the conditions in which the people of the country

live and work. It might be added that discussion of how the economy and society should develop does not go on only in so-called developing countries. The most highly developed countries now steer widely diverging courses, and sometimes change their direction.

This paper is on a more technical and more limited subject than economics, but cannot completely escape their influence; for a man's ideas on mankind and society may mould his technical opinions.

Observers are gradually coming to agree that to be completely successful a technical set-up and its attendant organisation (the "hardware" and "software" of industrialisation) require managerial staff, workers and their families to conform in mentality and behaviour to the original model. Industrialisation, technology and working organisation are not neutral. Those whom they touch they transform in ways explicitly or implicitly corresponding to the views of their originators. If transformation is incomplete technique and organisation do not achieve the production expected of them, either quantitatively or qualitatively. Economically speaking, this is a pity; but it may be the sign of a healthy reaction by society to the ruthless constraints being forced upon it.

If transformation is complete production will be excellent. It may even exceed that of the country from which the new technique and organisation came. But society as it was will be broken beyond recall, and all the evils of the industrial system - psychopathology, delinquency, industrial poisoning, pollution, and so on - will appear.

The above general remarks could be included in a training programme. Bearing them in mind, the first part of this paper will examine the scope of knowledge necessary to make a choice of technology and working conditions. The second part will consider/what the various social groups have to learn to act in constructive fashion.

2.0 THE SCOPE OF KNOWLEDGE

The idea that choice is possible between one technology and another or that a machine can be altered to improve working conditions is fairly new. It is the exact opposite of the "one best way" idea which was one of the mainsprings of the second industrial revolution and is still widely advocated by sellers of technology, the more so if they represent a trust that is particularly powerful in one or more regions of the world. The fact is that almost any result is obtainable by a wide variety of techniques, but obviously the cost-benefit relation is not the same for all techniques or in all countries. Economics should decide what choice is made; and it is usual before making any investment, large or small, to present the "decision-makers" with an imposing economic report.

Unfortunately some reports are unsound because they are based on features that differ too much from those prevalent in the purchasing country and make too limited an assessment of effects.

These features may be geographical ones, such as climate and communications; social ones, such as the quantity and quality of skilled labour and managerial staff available; or commercial ones, such as the size and stability of the local or regional market.

Assessment of effects on workers and their families may be too limited because of large-scale migrations which empty the countryside and fill shanty towns; on the environment, because of pollution of the atmosphere and water and resulting loss of essential agricultural resources; or on social and political developments, because of destruction of the previous social system, the creation of "the submerged tenth", and delinquency).

Any changes in economic and social life should be considered by reference to at least three criteria - the nation, the enterprise and the family. Occupational disease, employment injury, bigger wages,

a better food situation, and higher standards of proficiency cost or benefit the nation, the enterprise and the family very differently, according to what fiscal and social system is in force.

Regrettably, standard works of reference on socio-technics (adapting technology to the public at large) or ergonomics (adapting work to the worker) are usually negative in tone. They stress the harmful effects and social costs of technical change. This approach, when it is systematic, is deplorable; in most of South-East Asia the current/growth rate is only three per cent. This has to be increased. The necessary annual growth rate is five, six, seven per cent or more. Only bold technical innovation in industry and agriculture will make it possible. The only conceivable course, therefore, is to help on this technical change by presenting established data on those branches of science concerned with human performance in language which leaders of industry and engineers can use to promote social and economic progress.

The scope of knowledge needed for choice of technology and to create good working conditions may be broadly divided into two parts; first, choice of technology and adapting it to the community, and secondly, choice of the worker and adapting the work to him.

2.1 Socio-technics : choice of technology and adapting it to the community.

Many branches of science - geography and demography, anthropology and ethnology, sociology and economics - can be of use for this practical purpose.

2.1.1. Geography and demography. Obviously, knowledge of local geology and topography, of the natural drainage system, rainfall and climate are as essential to set up an immense sugar plantation and refinery in the North of the Ivory Coast as for a new lorry factory in the Euphrates Valley in Iraq. Equally, knowledge of human (and even historical) geography, and

of population trends, is necessary in either case.

It is not enough to know that the Ferkessedogou region is fertile and watered by a river (the Bandama) having a constant volume of water. Another essential element is that the neighbouring Korhogo area is thickly populated - by no means a usual state of affairs in this region, which has been very sparsely populated since the devastating wars of the 18th and 19th centuries. It is also relevant that the inhabitants of the Korhogo area spend part of the year cultivating food crops and are available for other work just when they would be needed, i.e., at the season for sugar-cane cutting (source : M. Coulibaly, Director of the Institut de Géographie Tropicale of the University of Abidjan). These geographical data also show that manpower is only relatively plentiful, and will have to be imported in great numbers from abroad unless, as in Australia or the South of the United States of America, it is decided to invest in sugar-cane cutting machines which do the work of 80 men. It is immediately obvious that in sugar-cane growing regions where underemployment is endemic and permanent (as in the States of Sao Paulo, Brazil, or Negros Occidental, Philippines) human geography provides arguments against the introduction of cane-cutting machines. Moreover, reference to climatic and agricultural geography shows that the cutting season is much longer in Brazil and the Philippines than in the Ivory Coast, so that manpower can be employed there all, or nearly all, the year round.

2.1.2. Anthropology and Ethnology. The usual practice in industrial countries would find sociological data sufficient for the study of life in a community. It may therefore seem curious to suggest including anthropological and ethnological matter in a socio-technics training programme.

But the fact is that in approaching sociological questions only from a sociological angle, using only sociological methods and theories, there

is no small risk of confusing phenomena of very different origins whose dynamics have therefore nothing in common. It would be foolhardy to compare the ten million population of Mexico City and suburbs with the ten million population of Greater Paris, or unemployment in Abidjan, London and New York, without observing due precautions.

Drastic as are the effects of the industrial system on ethnic and sociological structures, France, an old, industrial, centralised country, shows the political, economic and social penalties of too strictly unifying the development of the various parts of the country. In countries where people of different ethnic origins exist side by side, where there are even different peoples each with its own history, degree of technical development, and system of values, it is all the more dangerous to disregard such differences. This is true even if the government is attempting to bring about something as near as can be to national union. The valuable work of the Department of Anthropology of the University of the Philippines (Mr. P. Jocano), and the Institute of Ethnology and Anthropology of the University of Mexico, may be quoted in this connection. It is noteworthy that their research is not into the past, but uses linguistic analysis and description of the evolution of the family as an institution, of methods of production and ways of life, to study the gradual change of the old social system into the new society.

Some data are of immediate practical use. If, as often happens nowadays, it is proposed to build a factory in a Mahomedan country in a sub-tropical desert region to produce a given volume of goods yearly, it is essential to know how strictly the fast of Ramadan is kept. Where workers observe it to the letter, going without food and even water from sunrise to sunset, it is quite clear that in years when the fast falls

during the hot season production will fall sharply, particularly in hot workshops without air conditioning or where strenuous physical exertion is needed. Daily production capacity will therefore have to be increased. But there are ways of alleviating this situation. For example, in a number of Muslim countries some maintenance work is done mainly by non-Muslim nationals of the country, and a thorough review and servicing of equipment can be made to coincide with Ramadan. But such arrangements have the serious disadvantage of emphasising the rift between the industrial employment of two religious communities in a single country. There are, obviously, very close connections between anthropological data and the industrial set-up.

2.1.3 Sociology. It has become a commonplace to point out the connection between social change and industrialisation in a single country. In particular, study of the harmful effects of industrialisation on social life has so far progressed that the serious economic arguments for expanding the secondary sector are sometimes forgotten. Any teaching programme must therefore fully consider all the repercussions of industrialisation. This critical study is most useful where it is differential and illuminates the background of successful operations as well as unsuccessful ones : and the socio-technical and ergonomic approaches have in common that they are more interested in arriving at a constructive solution than in criticising a bad one.

To achieve anything useful scientific research must be of sufficient scope to appreciate how complex and contradictory is social change. For example, the distribution of tasks between men and women has been radically changed in Bali by harvesting rice not twice a year as in the past, but

three times, substituting a rice with a shorter stalk which has to undergo numerous processes (source : Professor Manuaba of Denpasar).

To take other examples, improved marketing of palm-tree fruit, the general increase in longevity, and the volume of emigration from neighbouring countries have led small landowners in the Ivory Coast who formerly ran their farms with the help of their sons to take on paid workers from Mali or the Upper Volta, and to switch from the social pattern of the village community to the wage system and private property. (Ivory Coast - source : Mr. Drevet-Sepes).

Socio-technics is mainly the study of the close relation between the means of production and the kind of social life which results. Thus the method of producing popular electronic apparatus such as radio and TV sets and cassette recorders makes necessary a complex social pattern which has to be built up from the beginning where it does not already exist, so that workers shall have the technical abilities required of them.

The socio-technical pattern thus obtained leads to the same psychopathological disturbances in Calcutta, Manila and Mexico City as in Paris, New York or Budapest. But in countries in course of industrial development the situation is aggravated because employed workers as a whole become a "race apart" of socially privileged beings - who suffer from psychological disturbances hitherto unknown in that part of the world.

Another aspect of relations between technology and society is the study of local sociological causes of the failure of an industrial undertaking. All over the world factories acquired at great cost by developing countries have closed down or are working below ~~their~~ capacity. A frequent cause of these bitter failures is the gross disproportion between manpower resources and technical equipment.

For example, an automated factory in a small town in a developing Latin-American country has closed down because the few automation technicians born in that country easily find work in large towns, where demand is great and life is considered to be pleasanter. The services of foreign technicians are prohibitively expensive because international salaries are high and exchange rates low.

In old industrial countries and towns a more subtle form of failure is frequent. A factory opens in an area of underemployment. It has jobs for a large number of workers. A few years later local underemployment is as bad as ever; the factory employs only foreigners, because only foreigners will accept the working conditions in it (e.g., the Southern Alsace region of France and SODEPALM in the Ivory Coast).

2.2.0 Ergonomy.

As has been shown above, the various branches of science dealing with human behaviour have undoubtedly influenced choice of technology conducive to better working conditions. But this part of socio-technics is still in its infancy and much work has still to be done on framing its basic ideas. This is not true of knowledge on the subject of adapting work to the worker. Ergonomic thought over the last 25 years has led to this being better understood and it is widely used throughout the world to improve working conditions.

This does not mean that all problems have been solved, least of all by countries in course of industrialisation. In fact research has been almost exclusively in temperate and cold countries on inhabitants who biologically speaking are in a very special position, and on a particular kind of technology. Research anywhere has been predominantly on cosmonautics and military aviation, and to a lesser extent on supervision of

the control panels of large automated plants in the electrical, petroleum, chemical and similar industries. There has been relatively little research into working conditions in mass production in industry and services, and very little indeed on what goes on in non-industrial agriculture and handicrafts.

In the special conditions of developing industrial countries the scope of knowledge needed to use ergonomics will by no means be that laid down in foreign books. Many treatises or précis on ergonomics are only partly applicable to such conditions. Re-definition of the scope of knowledge necessary can only be done by researchers from the developing industrial countries concerned. The following strikingly illustrates this : an international organisation asked a researcher from an Atlantic country to prepare a book on an important branch of ergonomics for world use. The book is in many ways excellent; but the subject leads to recommendations based essentially on anthropometry, and the author is at pains to point out that the data he quotes is not complete and applies essentially to 'Western Caucasians' (sic). There is, according to him, very little anthropometric data available on Asians other than Japanese; this in spite of the anthropometric research of Professor R.N. Senn in Calcutta, Professor A. Manuaba in Denpasar, Dr. Thu in Hanoi, the Child and Youth Research Center in Manila, and many others ... Its results have all been, or will be, published in scientific magazines or other publications, and are surely "available data".

Bearing in mind the above remarks, which anyone may expand as he pleases, the various branches of ergonomics should be taught with emphasis on description of the ^{actual} working population, exact analysis of work and working conditions, and a factual inventory of all aspects of the daily workload.

2.2.1 The Working Population.

This description may be infinitely subdivided but must always be related to the actual working population. Significant examples of the economically active population must be investigated, and differences between its various parts recorded - differences between workers in the primary, secondary and tertiary sectors, and differences in sex and age. All such distinctions are necessary for correct assessment of ability, as regards anthropometry no less than physical strength or keenness of vision. Thus the Institut National d'Hygiène et d'Epidémiologie in Hanoi has shown that the male Vietnamese worker is 1.58 metres (\pm 4 cm.) tall and the female Vietnamese worker is 1.495 metres (\pm 3 cm.) tall; but that in spite of their small stature the men's muscular strength is comparable with that of taller European workers. In terms of pressure exerted by the right hand it is 30-37 Kg. for men, and 19-25 Kg. for women. The authors note that the women's muscular strength falls much more than the men's, which is at its height at age 27 or thereabouts. These data have been of the very greatest importance in programming work in a bicycle factory recently built in Viet Nam by a French group.

Another important aspect of the ability of the working population is its state of health and nutrition. All too often parasites and chronic infections reduce their ability to work. With regard to their nutrition, their undernourishment may be quantitative because they do not earn enough to provide sufficient calories for themselves and their families; or qualitative, either because they earn too little or because the way they buy and prepare their food is contrary to their feeding habits.

When accumulating knowledge of the working population full attention should be paid to its standard of education (its literacy, vocational training and secondary or university education) and practical training.

There should be due recognition of the considerable abilities of workers trained in the old-fashioned way, who are expert in definite complex handicraft techniques and ~~so~~ ^{thus} easily adaptable to industrial processes with which they are unfamiliar.

2.2.2 Work Analysis.

Workload is very generally assessed with too strict reference to standards, and incompletely. As a result the actual position is seriously underestimated.

For example, a woodcutter's workload may be assessed in experimental conditions or good working conditions over a relatively short time, from observation of a young healthy experienced worker. In fact, as was shown in the previous section, differences in age, health and experience lead to great differences in workers' ability and determine different relative workloads. Also, the effort entailed by this kind of work varies enormously according to the quality of machines and tools and how well they are maintained. E. Grandjean of Zurich has shown that merely the pattern of teeth on a saw may make as much as 20 per cent difference to the effort expended. A point often underestimated is the duration of effort. Work of limited duration done under the research worker's and the timekeeper's supervision is very different from that done over a period of days, weeks or months.

Research by A. Laville has shown the great variations in the workload which are produced by the innumerable incidents occurring in what is seemingly completely monotonous work.

2.2.3 Making an Inventory of the Daily Workload.

Workload is not limited to paid working time. Difficult communications and travelling time have also to be considered. A two-hour journey is not

uncommon in large towns, and much longer journeys have to be made daily in immense quickly growing cities like Bangkok, Mexico City and Rio de Janeiro.

Another aspect of the workload concerns other work which for social or economic reasons has to be done by a single person. The author has shown elsewhere that women working in the French electronics industry spend something like $12 \frac{1}{2}$ hours daily on paid employment, travelling, and domestic work. This pattern comes up time and again all over the world when the working woman's timetable is examined.

Professor A. Manuaba of Denpasar points out the very important fact that a man may be a peasant between 4 a.m. and 10 a.m., an artisan between noon and 4 p.m., and a musician or waiter from 6 p.m. to 9 p.m.! A worker doing several ill-paid jobs infinitely complicates assessment and reduction of the workload.

The analysis required is complex in the extreme; but there is no getting away from it. There is no other means of finding out the truth and producing a strategy to improve working conditions which will be effective, humanly speaking, as well as economically acceptable.

2.2.4 Branches of Knowledge making a Contribution to Ergonomy.

The examples described above show that ergonomy is an integrated approach in which anthropometry, physiology, experimental psychology, hygiene and the study of pollution, together with technology and work organisation, help to describe and improve working conditions. It has also a powerful tool of its own, namely its methodology for analysing, introducing and validating working situations and changes therein.

3.0 IMPROVEMENT OF WORKING CONDITIONS : THE INFLUENCE AND TRAINING OF CERTAIN SOCIAL GROUPS.

As has been seen above, the excellence or otherwise, of working conditions is intimately bound up with many features of social life. All social groups should be conscious of their influence on working life, and mass media campaigns can be very effective in an all-out drive to make them so.

But this paper will be mainly concerned with the groups which directly affect working conditions; with the decision-makers (managers), engineers, specialists in labour problems, socio-technicians, ergonomists and with the workers themselves, whose influence is decisive but different. It will discuss what it seems necessary for each group to know, and the training methods applicable.

3.1 Necessary Knowledge for the Social Groups mentioned.

3.1.1 Decision-makers (managers).

Groups decisively influencing working conditions include financiers, planners, employers, trade unionists and senior administrative officials of the Ministry of Labour and Social Security.

3.1.1.1 Financiers.

Financiers decisively influence working conditions; by being generous or otherwise in providing social welfare, medical services or accident prevention, and by the way they assess the advantages and disadvantages of various types of technology and work organisation, such as assembly lines and alternating shifts. Their choice varies enormously according as the financial equilibrium considered is that of the enterprise or the nation as a whole and whether social compensations, (such as

health or housing programmes, action to reduce delinquency, and so forth) are considered, rather than the cost and advantages to the individual. Thus the cost of a worker suffering from silicosis is not the same for the enterprise, which may pay out very little, the social security system, which may pay a high pension, a low one, or none at all, and the sufferer and his family, who pay a high price in cash and suffering alike. Or depending on the method of assessment, the economic choice of method of cleaning cast metal in a foundry would be either sanding and shot-blasting.

3.1.1.2 Planners.

Planners do not always realise the importance of working conditions. The influence of bad working conditions on employment has been shown in Western Europe, where arduous work is done by foreign workers less particular about their working conditions whilst large numbers of unemployed nationals have to be given a bare living. To some extent the situation is similar in the Ivory Coast.

Planning also decides the broad choice between technologies entailing widely differing working conditions, for example, the degree to which agriculture is mechanised or industry automated.

3.1.1.3 Top Management.

Leaders of large enterprises, and of their trade union organisations, have to be fully aware of how important working conditions are to workers, who are not interested solely in what they earn even if they are very poor. And they have to realise that bad working conditions are extremely expensive : employment injuries are caused in much the same way as breakdowns in which material damage may be very great although workers escape injury. The cost of damage done to plant and equipment by such breakdowns is high.

Similarly, bad working conditions make for unreliable products of a quality too poor for the international market.

Thus, when investing in plant and financing its maintenance top management has to have in mind not only social difficulties but also the economic problems connected with bad working conditions.

3.1.1.4 Trade Unionists.

It seems obvious that the proper study of trade union leaders is working conditions. But it is often clear that workers think other social problems - employment, wages, pensions and social welfare - are the most important. Trade union leaders, in developing and developed industrial countries alike, have to make an effort to convince themselves as well as the workers that working conditions are inseparable from employment, wages and social welfare. There is no advantage in having a job, a wage, and a pension if accidents are many, sickness comes often, and a short working life ends in exhaustion.

3.1.1.5 Senior Labour and Social Security Administrators.

Officials responsible for drawing up and enforcing labour legislation and regulations are in the highest degree concerned with working conditions. But labour administrations all over the world have been known to make admirable regulations which for technical or economic reasons are impossible, or next to impossible, to apply. When temperatures soar in a factory in a tropical country with enormous glass walls facing South-West and a host of machines each with its heat engine, there is little to be done except knock the factory down and buy other machinery, or condition 20,000 or even 100,000 cubic metres of air.

The powers of labour administration must, then, be more concerned with technicalities, and its responsibilities limited to that stage of

the project at which the factory has not been built and machinery has still to be ordered. And senior labour administrators must not be trained purely and simply to make and enforce regulations.

The special teaching curriculum for all kinds of decision-makers is first and foremost socio-technical; the underlying principles of ergonomics are not explained to them in detail. First requisites are good statistics on employment injuries, breakdowns, occupational diseases, and labour turnover, and reliable financial assessments of the cost of bad working conditions, taking into account their incidence on production and the economy in general.

3.1.2 Engineers and Technicians.

Clearly, engineers and technicians are the people who create the technical set-up. The ergonomic knowledge essential to them is part and parcel of their technical training, and they have positively no choice but to acquire it.

As recommended by various international bodies years ago, engineers and technicians have necessarily to be given thorough ergonomic training from their schooldays onwards and also recurrent training on special problems which work done by man raises in their particular sector.

3.1.2 Specialised Groups.

Some persons on the staff of an enterprise, such as doctors, psychologists, and safety and organisation engineers, do work specifically covering human relations with the production set-up. They have to be not only competent in ergonomics but also potential instructors. They must accordingly have much more teaching.

3.1.3.1 Factory Doctors.

In many countries factory doctors do nothing but therapy, whereas

much of their work should be to assess the abilities of the working population and the epidemiology of the harmful effects of working conditions, to describe unfavourable working situations and make recommendations for their improvement. There are many examples of excellent training using this approach in South-East Asia (in India, Indonesia, Japan, Philippines, Singapore and elsewhere).

3.1.3.2 Labour Psychologists.

All too often, labour psychologists still work on staff selection or the psycho-sociology of disputes, whereas they should take the lion's share in investigating the causes of employment injuries and in work analysis in general. They are the people who can put their finger on the hidden difficulties in a technical set-up which lead to adverse behaviour, and they should bear much of the burden of ergonomic training.

3.1.3.3 Safety Engineers.

Safety engineers must take a decisive part in improving working conditions, especially as in many enterprises the tendency is to form a single "Safety and Working Conditions" department. Generally accepted views on safety must accordingly be widened, and orthodox activities such as applying regulations, using individual protectors, and safety posters or competitions be supplemented by vigorous use of ergonomic data and system analysis on the lines, for example, followed by the Total Loss Centre Training of the University of Hawai.

3.1.3.4 Organisation Engineers.

The present strong opposition to Taylorism in the industrial world is to a great extent legitimate; systematic Taylorism is by no means of value everywhere, and it is not the best system in much of modern industry.

But work still has to be properly organised. Ergonomy brings organisation

a very considerable volume of new, useful data which engineers have to assimilate so that useless workload can be cut down and confidence in the technical set-up increased.

3.1.3.5 Other Specialist Engineers.

It may be a surprise to find purchasing department engineers or new operations engineers on the list of specialised groups.

The fact is that officials buying machinery for their employers must be familiar with the standards relating to working conditions which it has to meet. Machines not up to ILO or ISO standards and unsaleable in some industrial countries must not be sold to enterprises in developing industrial countries.

New operations engineers are responsible for the removals and rearrangements so frequent in a factory. Each of these operations gives them a chance to improve working conditions which have long caused grumbling on the shop floor. They cannot do this if they are incompetent.

3.1.4 Socio-technicians and Ergonomists.

Every country and enterprise or group of enterprises needs high quality socio-technicians and ergonomists to give consultations and train other social groups.

It is ^{not} necessary to dwell on this general need, but every national background must be carefully studied so that the spirit and scope of these two specialities provide exactly what the country or enterprise requires, and models good in other circumstances are not incautiously adopted.

Evidently, to train such specialists calls for a great effort comprising two or three years of post-graduate training.

3.1.5 The Workers.

The workers' function in labour conditions is an immense subject, as yet relatively unexplored anywhere. This training should give workers a better understanding of their work and the dangers it entails, improve their behaviour and encourage them to propose improvements.

3.2 Training Methods.

Methods of training in working conditions are innumerable, if only in duration. This varies from the few hours of a seminar for decision-makers to several years for socio-technicians and ergonomists.

Differences do not end there. Much of the training has, of course, to be done at school as part of general training; this applies equally to metalworkers in their apprenticeship school and to the curriculum of would-be doctors, psychologists and engineers. Still more has to be done by recurrent training : existing staff has to be quickly trained; knowledge is soon out of date; and no one can go through life without adding to what he learned in his far-off schooldays.

Some training will be highly specialised; seminars will be held on working conditions in sugar growing-cum-refining estates or spinning mills, and specialists of various kinds - such as engineers, doctors, psychologists and labour inspectors - will be invited.

Some training will be in particular occupations, and ergonomic data can be submitted to factory doctors and research engineers.

For high-level specialists, or very restricted subjects such as working conditions in the merchant marine and data processing, international meetings are preferable. For South-East Asia it is certainly very desirable to hold numerous Asian meetings, particularly if they can get help from neighbouring countries such as India and Japan.

Teaching must be written as well as oral. There should preferably be a collection of books on socio-technics and ergonomics, and a scientific magazine on those subjects, for South-East Asia alone.

Brochures and popular newspapers might be very useful for mass dissemination.

4.0 CONCLUSIONS.

Working conditions are the result of extremely complex technical, economic and social phenomena associated with national geography, demography and anthropology.

One of the achievements of modern science is that it has better understood the relations between the various aspects of the situation and has suggested alternatives to apparently inadequate solutions.

The scope and complexity of the problems call for the services of large numbers of experts and informed action by many social groups.

To improve existing conditions, and particularly to build good working conditions up from the beginning in new production centres, there must be ample facilities for information and training.

The social consequences of such efforts are fewer employment injuries and less occupational disease, fatigue, absenteeism and labour turnover. Their economic consequences are less financial loss through breakdowns, better quality goods and a steadier flow of production; greater reliability of complex computerised and automated plant; and better use of material and spare parts, leading to fewer imports.

The ILO can play a very important part in this work, particularly if it can draw up regional training plans for South-East Asia.

Republic of the Philippines
Department of Labor
Regional Office No. 10
FIELD SERVICES DIVISION
Cagayan de Oro City

July 11, 1977

Prof. Alain Wisner
C Nam, 41 Rue Gay
Lussac, Paris, France

Dear Professor Wisner:

Thank you so much for referring my curriculum vitae to Mr. J. M. Duijvestein, Officer-in-Charge of International Labour Organization Office in Manila.

Mr. Duijvestein sent me an Application Form Employment Form of the International Labor Organization Office, together with his missive. Attached is a true copy of the letter of Mr. Duijvestein addressed to me.

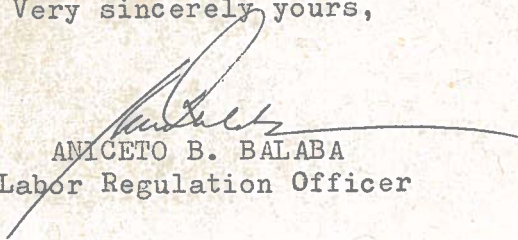
I have accomplished said application form and was mailed back to Mr. Duijvestein together with my reply. Enclosed, you will find my reply to Mr. J.M. Duijvestein.

I hope you will give me assistance as soon as that application will be forwarded by ILO Manila Office in Geneva for processing.

Again, thank you for the accommodation you have afforded me. I do hope we will see again.

My best regards to Mrs. Wisner and the kids.

Very sincerely yours,


ANICETO B. BALABA
Labor Regulation Officer

Encl: As stated

SEAL OF ILO

INTERNATIONAL LABOUR ORGANISATION
ILO Office

ORGANIZATION INTERNATIONALE DU TRAVAIL
Bureau du BIT

Telephones: 86-40-11 to 25
Cables: Interlab Manila
Telex No. 722@2276

Postal Address: P.O. Box 2865
Manila

Metropolitan Bank Bldg., 4th Floor
6813 Ayala Ave., Makati, Metro Manila
Philippines

Our Reference No. PIACT/GEN/1303
JMD/pr

10 June 1977

Mr. Aniceto B. Balaba
Labour Regulation Officer
100 Burgos Street
Cagayan de Oro City

Dear Mr. Balaba:

Professor Alain Wisner, whom you had very kindly assisted during his visit to the Philippines early this year, has referred your curriculum vitae and application letter to us for a possible assignment with ILO.

Although, unfortunately, I do not foresee any vacancy in the near future in your professional field, I am enclosing an application form for you to complete. After you have returned this form we will forward this to our headquarters in Geneva for processing.

We trust we shall hear from you soon.

Yours Sincerely,

(SGD.) J.M. DUIJVESTEN
Officer-in-Charge

Encl: As Stated

A True Copy from the Original

July 8, 1977



Republic of the Philippines
Department of Labor
Regional Office No. 10
FIELD SERVICES DIVISION
Cagayan de Oro City

July 11, 1977

J. M. Duijvestein
Officer-in-Charge
International Labour Organization
Metropolitan Bank Bldg., 4th Floor
6813 Ayala Ave. Makati, Metro Manila

Dear Mr. Duijvestein:

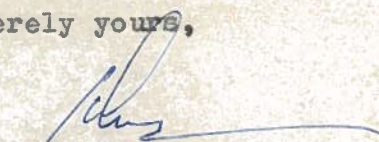
It pleased me to receive your letter, (your ref. PIACT/
GEM/1303/JMD/pr) together with the Application For Employment
Blank Form for me to accomplish.

Although, I was quite sad for the non-existing vacancy
at ILO fitted for my professional field, but I was consoled
of given the privilege of filling-up the ILO Application For
Employment Blank Form. Attached you will find the duly accom-
plished form.

In this connection, I am extending my heartfelt gratitude
to your kindness and most especially Professor Alain Wisner
for having given me a rare opportunity to apply at ILO. Please
notify me in the future for further developments of my appli-
cation.

My warmest regards and more power to you.

Sincerely yours,


ANICETO B. BALABA
Labour Regulation Officer

Encl: As stated

cc: Prof. Alain Wisner

**The University Planning Process:
A Suggested Approach**

By: Emanuel V. Soriano

The University of the Philippines, like any public or private organization, needs an effective planning process. But what for? Is there an "effective planning process" for the University? In answer to this question, this paper offers a suggested approach to planning.

L. Some Concepts

A. U. P.: A Dynamic Organism

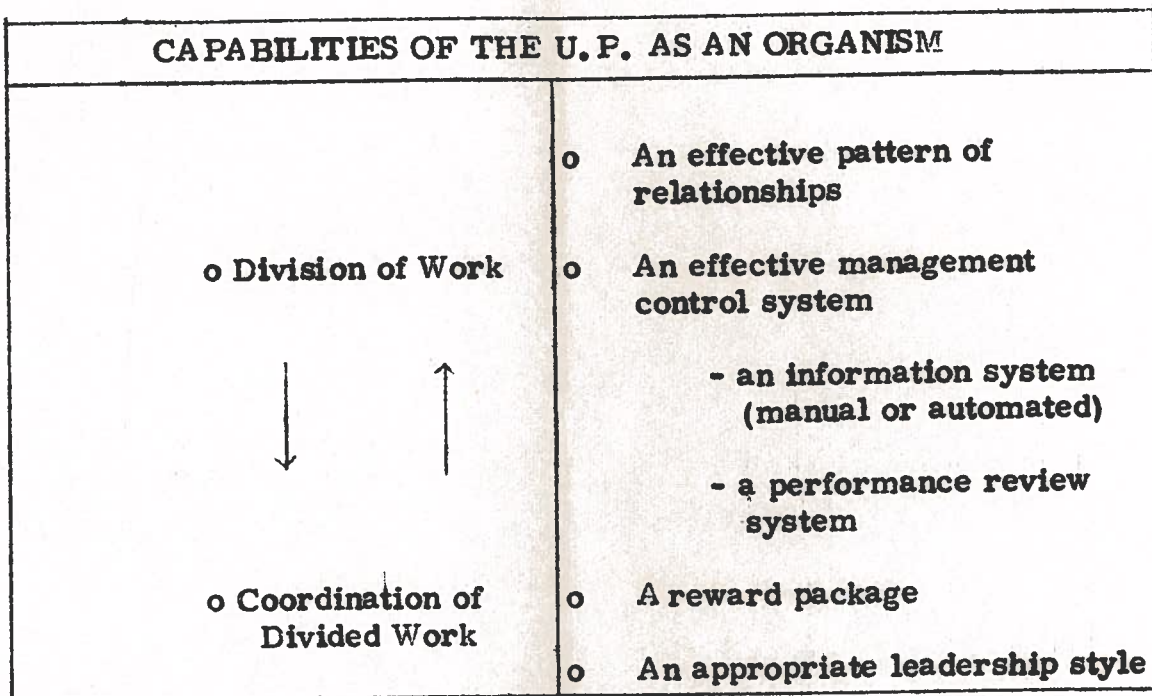
Most management practitioners use the word "organization" to refer to institutions like the University of the Philippines. This paper uses the word "organism" because it is a more dynamic and descriptive word to describe the U. P.

U. P. as an organism may be described as shown in Figure 1.

This paper, a recommended reading for all U. P. constituencies, is an effort to describe the U. P. planning effort which has been in the process of institutionalization since 1975 and is now entering the third cycle of its application. The author is the Executive Vice-President of the University of the Philippines.

Figure 1

U. P. : An Organism



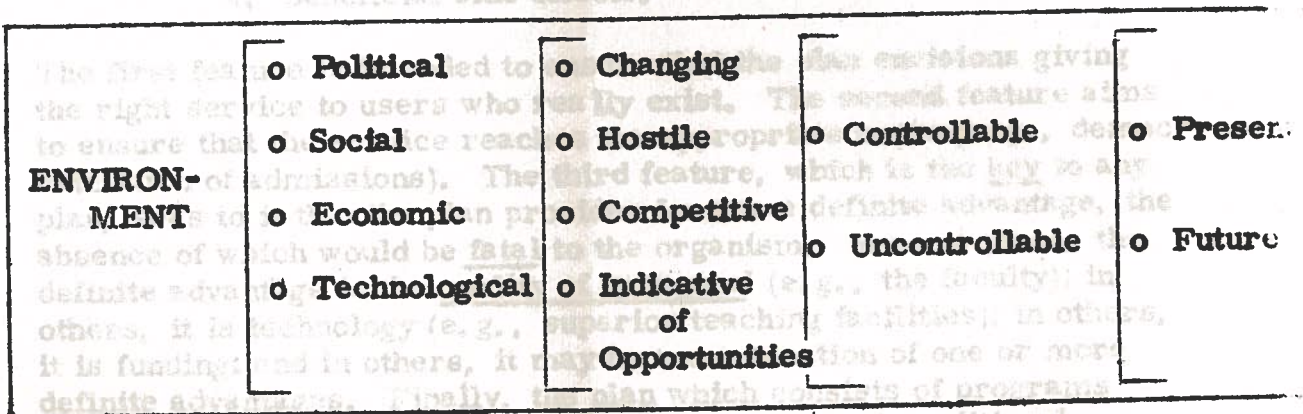
An organism should reflect certain capabilities as shown in Figure 1. An organism must be capable of dividing work and coordinating work that has been divided among various parts of the organism. An organism must have an effective pattern of relationships among persons and offices which provides not only a wholesome working atmosphere but also a basis for dividing work and for coordinating divided work. An organism must have an effective management control system. This means that it must be able to (1) keep track of what is going on by means of an effective management information system (MIS) and (2) compare what is going on (i. e., actual results) with what is supposed to be going on (i. e., the organism's development plan) by means of an effective performance review system. There must also be an appropriate reward package to enhance a just distribution of benefits. Finally, an organism must have an adequate pool of leaders with appropriate leadership styles.

B. The Environment

As an organism, U. P. exists and operates within a certain environment. This environment has environmental forces which may be grouped into political, economic, social and technological factors. These environmental forces are changing and often contribute to making the environment hostile, competitive, or indicative of opportunities. Some of these environmental forces are controllable; some are uncontrollable. Finally, there is a present environment and a future or anticipated environment. It is within this present environment that an organism seeks to survive and be useful. The organism which can accurately anticipate its environment has a very good chance of continuing to operate almost indefinitely. A diagram to summarize the ideas may be found in Figure 2.

Figure 2

The Environment



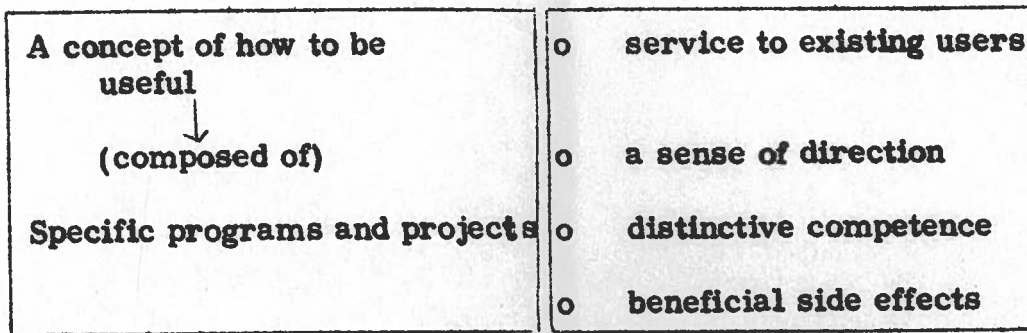
C. A Plan (or Strategy)

A plan (or strategy) is an organism's way of coping with or relating to the environment. A plan may also be regarded as:

- an organism's concept of how to make a contribution to public welfare or
- an organism's concept of how to be useful to society.

Figure 3

The Concept of A Plan



D. The Plan and Management

Management may be defined as the formulation and implementation of a plan (or strategy). In other words, the main function of a leader (e.g., University President, Dean, Chairman or Officer) is to formulate and implement a plan or to cause (e.g., through a participative process) the formulation and implementation of a plan for the office or organism he or she leads.

II. A Model of the Planning Process

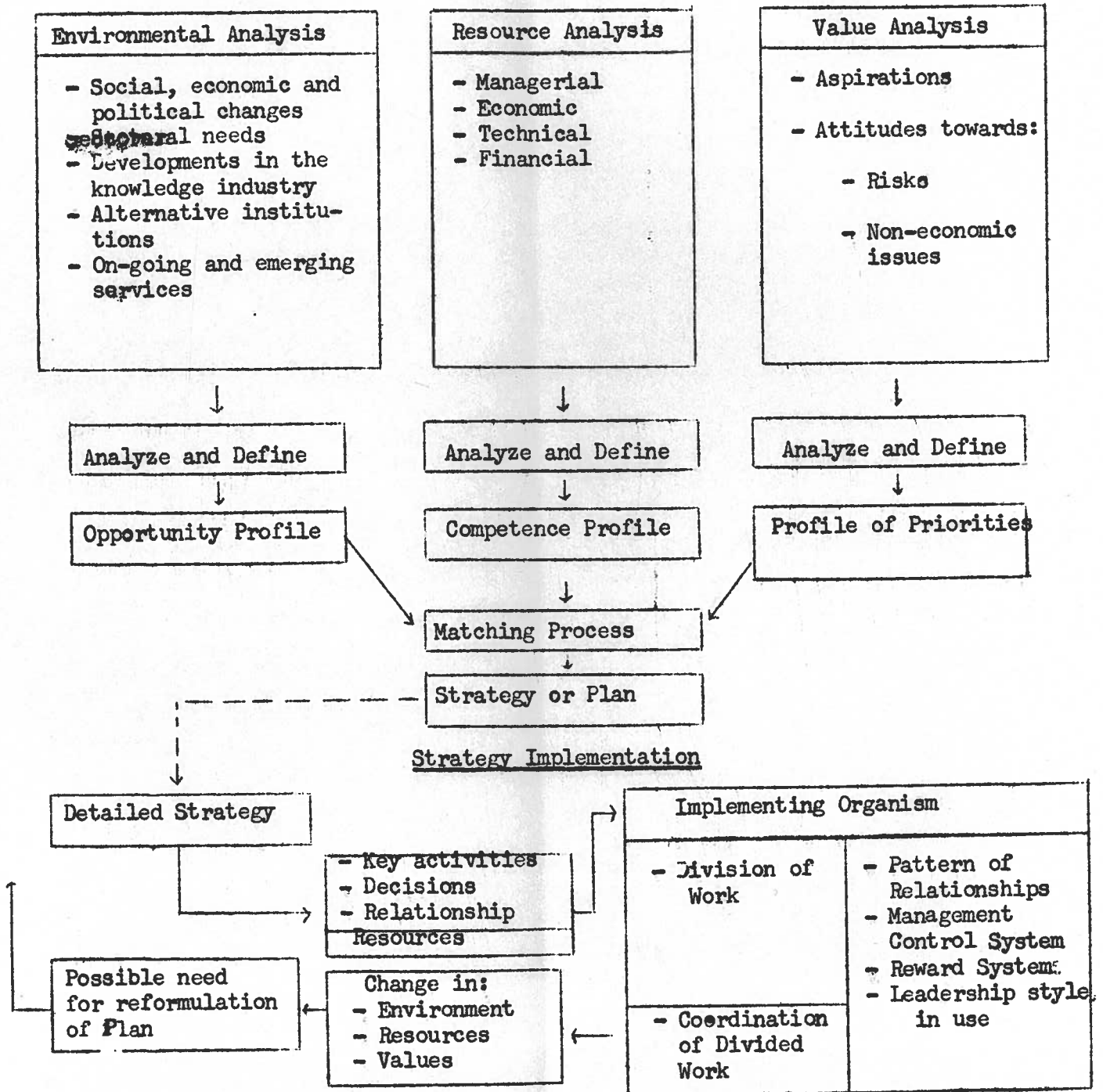
A model of the planning process is shown in Figure 4. This model is appropriate for university planning and is briefly discussed in this paper. Note that "strategy" as used subsequently is as defined previously in this paper. Note, too, that organizational strategy is taken to have the same meaning as the organizational plan.

Briefly, strategy formulation consists of four processes as follows:

- Environmental analysis, the output of which is a profile of opportunities for the organism to be useful

Figure 4

A Model of Planning Process Strategy Formulation¹



¹ Adapted from Joseph L. Bower

- Resource analysis, the output of which is a profile of the organism's competence or a profile of what the organism can or cannot do

- an analysis of "values", the output of which is a profile of priorities or a profile of what an organization wants or does not want to do.

The outputs of these processes are subjected to another process - the matching process. Here, opportunities, competence and values are matched such that those opportunities which are consistent with the organism's competence and values are exploited. The output of this matching process is the organism's strategy shown in Figure 3.

Underlying the processes described above are certain assumptions regarding effective techniques for environmental analysis (e.g., forecasting techniques), resource analysis (e.g., financial techniques, personnel inventory techniques), analysis of values (e.g., risk analysis) and for the matching process (e.g., cost/benefit analysis, project studies). This paper does not discuss these assumptions and leaves it for the reader to obtain information on these areas based on the work of scholars and management practitioners.

III. The Time Horizon for Planning

The University's strategy should have three time horizons:

- the long-term thrust or perspective plan (25 years or longer)
- the commitment horizon (about 5 years) and
- the action horizon (the next 12 months).

The first horizon is embodied in a long-range development thrust (e.g., U, P, and the Future); the second horizon, in a 5-year commitment plan (CP); and the third horizon, in an action plan (AP). The CPs and APs which consist of specific programs and projects are submitted to the Budget Commission every year.

The "action plan" is crucial in terms of translating portions of a long-term plan into reality. This is the phase of planning closest to actual implementation and heads of units play the key role in this particular phase.

Effective implementation of a commitment plan and of an action plan depends on effective implementation approaches as shown in the lower part of Figure 4. But, that would be bringing us another extensive area of discussion which is not included in this paper.

IV. The Planning Process: The U. P. Experience

The planning process (PP), as applied to U. P., may be described as follows:

A. The Major Activities

1. Workshop of Various Units - During the current year, workshops of various units (academic and non-academic) are held from about August to October (a) to update the 5-year commitment plan (CP) and (b) to review the portion of the plan (programs/projects) for implementation during next year. As much as possible, all staff members and student representatives, whenever feasible, are involved in these workshops. These workshops correspond to environmental analysis and setting of priorities at the unit level.

2. Submission to Central Administration - The Unit CPs are submitted to the Office of the President (c/o the Program Development Staff or PDS) for consolidation. This is done in November and the output of this effort is an updated perspective plan (i. e., The U. P. and the Future). This preliminary output is also discussed by the Board of Regents.

3. The Annual Workshop of Heads of Units - This workshop for all heads of units as representatives of their various constituencies is held in the month of January. Its purpose is to generate feedback on the various ideas relative to on-going and proposed programs of the University. This workshop meets the need for environmental analysis as well as the setting of priorities on a university-wide level.

4. The Executive Review (ER) - The ER is conducted in February. It is a one-day meeting of groups of related units (about 5 units like the College of Business Administration, the College of Public Administration, the Philippine Executive Academy, the Institute for Small-Scale Industries and the School of Economics) with officers of central administration. The ER is intended to provide a useful dialogue on the details of the plans of various units. Unit budgets and priorities for the coming year are discussed at this time. The ER results in further refinements on the perspective plan as well as a revised budget estimate for the next year.

5. Submission of Budget Proposal to the National Government (through the Budget Commission) - The consolidated proposed budget arrived at as a result of the ER, is submitted to the Budget Commission for review and consideration. Dialogues with the Budget Commission are completed in May or June. After the national budget has been drawn up or discussed by the Batasang Bayan in September, the Budget Commission announces the budget ceiling for all government agencies including the U. P. by about October.

6. Internal Allocation through an FAP Process and Approval by the Board of Regents - From about October to December, the U. P. goes through a process of internal allocation for the next year's budget through a process of allocating Funds for Additional Projects (FAP). This is essentially a further process of reviewing priorities in order to match the cost of projects for implementation during the year with the actually available funds as indicated by the budget ceiling. This internal allocation, upon confirmation by the Board of Regents, completes the annual planning and budget cycle. Meanwhile, the U. P. planning process for the next cycle (i. e., for the year after next year) will have already started.

B. Some Basic Features of the Planning Process

The foregoing planning process may thus be characterized as follows:

1. It is participative.

2. It is a continuing process.
3. It has a recurring 12-month cycle.
4. It is resource-seeking.
5. It is goal-setting.

The participative feature means that the unit has the basic initiative for planning its own future and for assisting the University's central administration in establishing to various funding groups (including the national government) that its programs deserve to be supported. Thus, the Office of the President acts basically as a facilitator of the planning process. It does not plan for the various units of the U. P.; its task relates to the University as a whole.

The continuing feature means that the plan of the U. P. must be updated at least once a year. Appropriate changes must be reflected as soon as possible because the U. P. operates within a changing environment.

The recurring cycle suggests the need to conduct planning activities on a seasonal or cyclical basis so that participants learn to anticipate the activity and prepare for it.

The resource-seeking feature means that although not all program/project ideas can be included for funding in a particular budget cycle, the planning process will develop an inventory of ideas which the University's central administration can promote for support by interested funding agencies (e. g., the World Bank) or which can be funded whenever the national government is able to provide a substantial increase in the University's budget.

The goal-setting feature underscores the fact that all programs/projects should serve a purpose or a goal. The same set of goals may require different priorities over time. Some specific goals may be altered while others are added.

C. Some Difficulties

In our initial efforts to improve the way we use our limited resources through planning, some difficulties have emerged. The major problems are as follows:

1. Some units still do not take the planning process seriously and regard it as a one-person show.
2. Some Heads of Units still do not see the planning process as the most important aspect of their responsibility and tend to rely on very low-level staff members to do the planning work.
3. Some units which need information and additional planning expertise do not seek assistance and, as a result, submit rather unsatisfactory working papers which make further analysis a difficult, time-consuming and wasteful process.

D. Some Forthcoming Innovations

Staff work to computer-base some parts of the planning process is now going on. This effort consists mainly in the design of new planning and budget forms which will facilitate computer processing and analysis. This new capability will make higher standards of accuracy possible and considerably speed up the process.

#

MANILLE

Dec 77

Tang Tack
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Dean HERRERA

9 am

Fac Medicine

Thurs Dec 8

Pedagog

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JOSE Thursday 8
68 Thursday 15
Tuesday 13

FES Federico Eleri Siftung

M. Otto DUMBACK Acting resident representative

P.O. Box 106 CATLEVA Bdg

235 SALCEDO ST

LEGASPI Village MAKATI

Tel 86.72.81

✓
Thursday 15¹⁴
12 am
BAYVIEW

11, RUE CAYLUS - PARIS 8^e

amalgam ferdinande leguen

ψ expi appliqué
ψ expi qu'elle.

→ melle alle
→ melle ferdinande
4m 44 d'heure

Par de rappu' avec le liant via

le ψ de
liant
carré ψ
ferré d'acier.

Analyse du travail
côté nous par enus de l'application de la
méthode ψ
- melle ferdinande melle. ψ exp.

Mieux connaître les données et liant

- Relations spatiales
- Sonnet verbal
- Analyse du liant
l'individualité du liant
- situation spatiale.

Naville relation

ψ patho
idéaux.

- Linguistique
- Étologie patient et de jeu
- Préparation du liant
↳ melle alle
↳ melle.

—

le travail comme
lien de recherche
fondamental

l'absence
de complexité
et de variété
initiale
~~complexité~~
~~répétition de formes~~

Pendant 20 ans
Commissariat

Le Douaire
Prof Pl amelle
Foc Simon Xantès

4 patho et linguistique ^{pas de grande}
le travail comme médiateur de cognition
computative (pour les gens peu d'infos)
et éducatif

apprentissage et continuité
répétition - image
visuelle

communication verbales
accusatif pluriel. Les genres

- c'est ^{non corrélat} ^{mais on dit ce dit}
neuro 4
4 paraly. du liant.
éducatif.

- repérage spatial

autonomie du travail
du langage
des vices

pas plutôt d'insécurité et
niveaux

mais demande sociale.

UNIVERSITY PARTICIPANTS OF THE WORKSHOP ON 'PIACT' AT HOTEL FILIPINAS

24 FEBRUARY 1977

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4. DAVID, F.G.	Dept. of Psychology Coll. of Arts & Sciences Univ. of the Phil. Diliman, Quezon City	96-34-96
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8. PASCUAL, Luis D.	Dept. of Industrial Engineering Univ. of the Phil. Diliman, Quezon City	97-60-61
9. RUBIO, Clarissa A. (Miss)	Dept. of Sociology Coll. of Arts & Sciences Univ. of the Phil. Diliman, Quezon City	96-34-96
10. VILORIA, Paterno	Institute for Small Scale Industries Deputy Director's Office Univ. of the Phil. Diliman, Quezon City	98-10-34

RIN DE GROOT
TNO



INTERNATIONAL LABOUR OFFICE
BUREAU INTERNATIONAL DU TRAVAIL
OFICINA INTERNACIONAL DEL TRABAJO

Adresse postale CH-1211 GENÈVE 22
Télégrammes INTERLAB GENÈVE
Télex 22.271
Téléphone 98 52 11

Réf. BIT/ILO n° PIACT 4-1
PIACT 2-103

Votre réf. n°

Professeur Alain Wisner,
Conservatoire national
des Arts et Métiers,
Département des Sciences
de l'Homme au Travail,
41, rue Gay-Lussac,
75005 PARIS

(France)

envoyés le 24.11.77

21 NOV 1977

Cher Monsieur,

J'ai reçu votre lettre du 14 novembre ainsi que l'exemplaire de votre rapport de mission en Côte-d'Ivoire qui lui était joint et vous en remercie.

M. Massün a déjà pris connaissance de ce texte qu'il trouve très intéressant. Il vous fera directement part de ses réactions et commentaires éventuels. Quant à moi, je compte le lire dans les jours prochains et espère avoir l'occasion d'en discuter avec vous à Manille. En attendant, je vous saurais gré de bien vouloir nous envoyer vingt exemplaires supplémentaires de ce rapport. ~~à l'attention de~~

Dans l'attente de vous revoir à Manille, je vous prie de croire, cher Monsieur, à l'expression de mes sentiments cordiaux.

G. Spyropoulos,
Chef du
Service des conditions de travail
et de vie,
Département des conditions et
du milieu de travail.



BUREAU INTERNATIONAL DU TRAVAIL
GENÈVE

LE DIRECTEUR GÉNÉRAL

23 NOV 1977

Cher Monsieur,

Juste avant de partir pour Manille - où j'espère que nous nous rencontrerons - je tiens à vous remercier très chaleureusement de votre lettre du 14 novembre 1977.

Votre témoignage d'amitié m'a beaucoup touché. Emanant d'un homme qui connaît directement l'action de l'OIT, sur le terrain comme à Genève, il encourage encore plus le Bureau et son Directeur général à poursuivre dans la voie qu'il s'est tracée : oeuvrer concrètement pour améliorer le sort des plus déshérités, travailleurs des villes et de la terre, surtout dans les pays les moins favorisés. Cela seul compte.

Je lirai avec intérêt votre rapport sur l'agriculture en Côte d'Ivoire, dont on me dit déjà le plus grand bien.

Veillez agréer, cher Monsieur, avec mes remerciements l'expression de mes sentiments très cordialement dévoués.



Francis Blanchard

Monsieur Alain Wisner
Professeur
CNAM
41, rue Gay-Lussac
75005 - Paris



INTERNATIONAL LABOUR OFFICE
BUREAU INTERNATIONAL DU TRAVAIL
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75005 PARIS

(France)

25 NOV 1970

Cher Monsieur,

A mon retour d'une mission au Vénézuéla, j'ai lu avec intérêt le rapport sur votre mission en Côte d'Ivoire qui était joint à votre lettre du 14 novembre, dont je vous remercie.

Les recommandations que vous formulez quant à la nécessité de distinguer, dans le secteur agricole, les travailleurs salariés des entreprises agro-industrielles et agricoles et les travailleurs non-salariés et de susciter par conséquent des modèles d'organisation et de relations différents pour ces deux catégories, rejoignent tout à fait celles que formulait la mission PIACT qui s'est rendue au Sénégal en mai dernier. J'ai été heureux de voir l'importance que vous attachez à l'action des G.V.C. et du CENAPEC en général.

Comme vous le savez peut-être déjà, M. Massun a eu de nouveaux entretiens en Côte d'Ivoire à l'occasion de la tenue de la Conférence Regionale Africaine de l'OIT fin septembre - début octobre et actuellement Mlle Savignac, psychosociologue du travail de l'Institut de Recherche en Amélioration des conditions de travail, qui se rendait en Côte d'Ivoire, a été chargée de deux recherches, menées avec l'appui du Centre ivoirien de recherches économiques et sociales et portant l'une sur l'impact de l'introduction de la culture attelée sur les conditions de travail des paysans du nord et l'autre sur les effets sociaux des G.V.C. en Côte d'Ivoire. Vous voyez donc que l'action se poursuit pour nous permettre de mieux connaître la situation, et de ce fait les possibilités d'action, spécialement dans ce secteur agricole non-salarié.

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Il vous intéressera sans doute de savoir que, bien que la Conférence régionale africaine n'avait pas à son ordre du jour un point technique relatif aux conditions et au milieu de travail, elle a adopté sur ce sujet une résolution qui se félicite de l'action du PIACT en Afrique et demande qu'elle soit renforcée. Vous en trouverez ci-joint le texte.

J'espère que les discussions de Manille seront fructueuses. Rien n'est négligé pour leur préparation.

Veillez agréer, cher Monsieur, l'expression de mon souvenir très cordial.



J. de Givry
Chef du Département des conditions
et du milieu de travail.

Résolution concernant les conditions de travail et l'environnement

La cinquième Conférence régionale africaine de l'Organisation internationale du Travail,

Étant réunie à Abidjan du 27 septembre au 6 octobre 1977;

Considérant la nécessité d'améliorer les conditions de travail et de préserver l'environnement dont la détérioration joue un rôle négatif et préjudiciable à la santé et à l'équilibre des travailleurs;

Considérant la lenteur et l'insuffisance des progrès réalisés ces dernières années dans certains pays d'Afrique dans ces domaines, notamment en ce qui concerne la sécurité et l'hygiène du travail et la durée du travail;

Considérant que l'utilisation croissante de nouvelles technologies engendre de nouveaux problèmes de sécurité du travail et de protection des travailleurs;

Considérant que les industries africaines relativement jeunes doivent tirer les leçons des expériences accumulées dans les pays développés et éviter les erreurs, notamment : la pollution, la dégradation des conditions de travail (insécurité, intensité, bruits, odeurs, insalubrité, nuisances de toute sorte, etc.);

Considérant l'insuffisance, voire l'inexistence des mesures législatives dans certains pays, la pénurie de cadres et d'infrastructures appropriées pour garantir et préserver la santé des travailleurs sur les lieux de travail;

Considérant que la préservation de la santé et de l'équilibre physique et psychique du travailleur est un objectif qui retient une grande attention des syndicats, des employeurs et des gouvernements;

Considérant que l'amélioration des conditions et du milieu de travail constitue la tâche fondamentale de l'OIT en Afrique comme d'ailleurs afin de renforcer la protection des travailleurs et de s'assurer que le progrès social va de pair avec le progrès économique;

Notant avec satisfaction que la Conférence générale de l'OIT a adopté, lors de sa soixantième session en juin 1975, la résolution sur l'action future de l'Organisation internationale du Travail dans le domaine des conditions et du milieu de travail, résolution qui invite, d'une part, les Etats Membres à promouvoir les objectifs tendant à une amélioration des conditions et du milieu de travail et, d'autre part, le Conseil d'administration du Bureau international du Travail à charger le Directeur général de lui soumettre un programme international destiné à promouvoir ou à appuyer les activités des Etats Membres dans ce domaine, programme devant comporter en particulier la mise en place d'équipes multidisciplinaires composées de spécialistes des conditions et du milieu de travail;

Notant avec satisfaction que le Conseil d'administration du Bureau international du Travail a approuvé, lors de sa 20^{ème} session (novembre 1976), les lignes générales du Programme international pour l'amélioration des conditions et du milieu de travail (PIACT) qui lui a été soumis par le Directeur général du Bureau international du Travail;

Se félicitant que, dans le cadre de ce programme, des activités ont déjà été entreprises, d'une part, par certains pays pour développer leurs activités en vue d'améliorer les conditions et le milieu de travail et, d'autre part, par le BIT, au titre de ses actions de coopération technique,

1. Recommande la poursuite des efforts entrepris pour l'amélioration des conditions de travail et l'environnement, de façon à permettre aux travailleurs d'exercer en toute sécurité, selon des normes sanitaires et hygiéniques appropriées, leurs fonctions.

2. Demande aux gouvernements africains et aux organes spécialisés compétents de prendre toutes les mesures pour diffuser, faire appliquer ou édicter les textes législatifs garantissant aux travailleurs des conditions satisfaisantes dans les lieux de travail.

3. Encourage la formation de cadres qualifiés chargés de contrôler les conditions de travail et demande à toutes les parties concernées d'œuvrer en commun pour faire des lieux de travail des centres où le travailleur évolue en toute confiance, en toute sécurité, bénéficiant de l'assistance sanitaire et sociale en permanence.

4. Demande aux gouvernements, aux employeurs et aux travailleurs de coordonner leurs efforts pour empêcher toute prolifération d'industries polluantes, toxiques et dangereuses ou d'en contrôler et réglementer l'installation et de veiller au respect des normes scientifiques édictées en matière de préservation de la santé des travailleurs, notamment en ce qui concerne les bruits, l'éclairage, l'intensité, les odeurs, les rythmes, la durée, les travaux pénibles et insalubres, etc.

5. En appelle à tous les Etats africains Membres de l'OIT afin qu'en collaboration avec les organisations de travailleurs et d'employeurs ils prennent des dispositions pour passer régulièrement en revue la situation des conditions et du milieu de travail sur le plan national, pour se fixer un certain nombre d'objectifs précis destinés à améliorer ces conditions et pour mettre en œuvre les mesures concrètes jugées nécessaires.

6. Suggère aux Etats africains qui éprouvent des difficultés à définir et à exécuter des programmes en la matière de recourir, le cas échéant à la coopération technique du BIT pour surmonter ces difficultés, notamment sous forme d'envoi de missions d'équipes multidisciplinaires du PIACT.

7. Invite l'Organisation internationale du Travail à intensifier son action tendant à aider les Etats d'Afrique qui en feraient la demande à développer leurs politiques et leurs programmes d'action pour l'amélioration des conditions et du milieu de travail par des mesures telles que :

- a) un effort de promotion spécial destiné à encourager la mise en œuvre, par les Etats africains, des normes internationales du travail relatives aux conditions et au milieu de travail;
- b) le rassemblement et la diffusion systématiques d'informations sur les expériences d'amélioration des conditions et du milieu de travail déjà réalisées en Afrique et ailleurs;
- c) l'organisation de cycles d'études et de formation sur les conditions et le milieu de travail à l'intention des responsables gouvernementaux, des cadres dirigeants d'entreprise et des organisations d'employeurs et de travailleurs et l'introduction, dans les autres programmes de formation de l'OIT, d'éléments relatifs à l'amélioration des conditions et du milieu de travail;
- d) la mise en place dans la région et, le cas échéant, dans les sous-régions, d'équipes multidisciplinaires permanentes de spécialistes, mentionnées dans la résolution précitée de la Conférence générale de l'OIT;
- e) le lancement d'expériences pilotes d'amélioration des conditions et du milieu de travail dans les zones rurales;
- f) l'inscription à l'ordre du jour de la prochaine session de la Commission consultative africaine de la question de l'amélioration des conditions et du milieu de travail.

D. Résolution concernant la ratification et la mise en œuvre des normes internationales du travail en Afrique

La cinquième Conférence régionale africaine de l'Organisation internationale du Travail,

S'étant réunie à Abidjan du 27 septembre au 6 octobre 1977;

Considérant que les normes internationales du travail sont d'une importance capitale pour les activités de l'OIT et constituent un élément essentiel dans la définition d'objectifs et moyens d'action pour la protection des droits de l'homme, la promotion de l'emploi, la satisfaction des besoins essentiels et la réalisation du progrès social;

Résolution concernant les conditions de travail et l'environnement

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Considérant la nécessité d'améliorer les conditions de travail et de préserver l'environnement dont la détérioration joue un rôle négatif et préjudiciable à la santé et à l'équilibre des travailleurs;

Considérant la lenteur et l'insuffisance des progrès réalisés ces dernières années dans certains pays d'Afrique dans ces domaines, notamment en ce qui concerne la sécurité et l'hygiène du travail et la durée du travail;

Considérant que l'utilisation croissante de nouvelles technologies engendre de nouveaux problèmes de sécurité du travail et de protection des travailleurs;

Considérant que les industries africaines relativement jeunes doivent tirer les leçons des expériences accumulées dans les pays développés et éviter les erreurs, notamment : la pollution, la dégradation des conditions de travail (insécurité, intensité, bruits, odeurs, insalubrité, nuisances de toute sorte, etc.);

Considérant l'insuffisance, voire l'inexistence des mesures législatives dans certains pays, la pénurie de cadres et d'infrastructures appropriées pour garantir et préserver la santé des travailleurs sur les lieux de travail;

Considérant que la préservation de la santé et de l'équilibre physique et psychique du travailleur est un objectif qui retient une grande attention des syndicats, des employeurs et des gouvernements;

Considérant que l'amélioration des conditions et du milieu de travail constitue la tâche fondamentale de l'OIT en Afrique comme d'ailleurs afin de renforcer la protection des travailleurs et de s'assurer que le progrès social va de pair avec le progrès économique;

Notant avec satisfaction que la Conférence générale de l'OIT a adopté, lors de sa sixième session en juin 1975, la résolution sur l'action future de l'Organisation internationale du Travail dans le domaine des conditions et du milieu de travail, résolution qui invite, d'une part, les Etats Membres à promouvoir les objectifs tendant à une amélioration des conditions et du milieu de travail et, d'autre part, le Conseil d'administration du Bureau international du Travail à charger le Directeur général de lui soumettre un programme international destiné à promouvoir ou à appuyer les activités des Etats Membres dans ce domaine, programme devant comporter en particulier la mise en place d'équipes multidisciplinaires composées de spécialistes des conditions et du milieu de travail;

Notant avec satisfaction que le Conseil d'administration du Bureau international du Travail a approuvé, lors de sa 20^{ème} session (novembre 1976), les lignes générales du Programme international pour l'amélioration des conditions et du milieu de travail (PIACT) qui lui a été soumis par le Directeur général du Bureau international du Travail;

Se félicitant que, dans le cadre de ce programme, des activités ont déjà été entreprises, d'une part, par certains pays pour développer leurs activités en vue d'améliorer les conditions et le milieu de travail et, d'autre part, par le BIT, au titre de ses actions de coopération technique,

1. Recommande la poursuite des efforts entrepris pour l'amélioration des conditions de travail et l'environnement, de façon à permettre aux travailleurs d'exercer en toute sécurité, selon des normes sanitaires et hygiéniques appropriées, leurs fonctions.

2. Demande aux gouvernements africains et aux organes spécialisés compétents de prendre toutes les mesures pour diffuser, faire appliquer ou édicter les textes législatifs garantissant aux travailleurs des conditions satisfaisantes dans les lieux de travail.

3. Encourage la formation de cadres qualifiés chargés de contrôler les conditions de travail et demande à toutes les parties concernées d'oeuvrer en commun pour faire des lieux de travail des centres où le travailleur évolue en toute confiance, en toute sécurité, bénéficiant de l'assistance sanitaire et sociale en permanence.

4. Demande aux gouvernements, aux employeurs et aux travailleurs de coordonner leurs efforts pour empêcher toute prolifération d'industries polluantes, toxiques et dangereuses ou d'en contrôler et réglementer l'installation et de veiller au respect des normes scientifiques édictées en matière de préservation de la santé des travailleurs, notamment en ce qui concerne les bruits, l'éclairage, l'intensité, les odeurs, les rythmes, la durée, les travaux pénibles et insalubres, etc.

5. En appelle à tous les Etats africains Membres de l'OIT afin qu'en collaboration avec les organisations de travailleurs et d'employeurs ils prennent des dispositions pour passer régulièrement en revue la situation des conditions et du milieu de travail sur le plan national, pour se fixer un certain nombre d'objectifs précis destinés à améliorer ces conditions et pour mettre en oeuvre les mesures concrètes jugées nécessaires.

6. Suggère aux Etats africains qui éprouvent des difficultés à définir et à exécuter des programmes en la matière de recourir, le cas échéant à la coopération technique du BIT pour surmonter ces difficultés, notamment sous forme d'envoi de missions d'équipes multidisciplinaires du PIACT.

7. Invite l'Organisation internationale du Travail à intensifier son action tendant à aider les Etats d'Afrique qui en feraient la demande à développer leurs politiques et leurs programmes d'action pour l'amélioration des conditions et du milieu de travail par des mesures telles que :

- a) un effort de promotion spécial destiné à encourager la mise en oeuvre, par les Etats africains, des normes internationales du travail relatives aux conditions et au milieu de travail;
- b) le rassemblement et la diffusion systématiques d'informations sur les expériences d'amélioration des conditions et du milieu de travail déjà réalisées en Afrique et ailleurs;
- c) l'organisation de cycles d'études et de formation sur les conditions et le milieu de travail à l'intention des responsables gouvernementaux, des cadres dirigeants d'entreprise et des organisations d'employeurs et de travailleurs et l'introduction, dans les autres programmes de formation de l'OIT, d'éléments relatifs à l'amélioration des conditions et du milieu de travail;
- d) la mise en place dans la région et, le cas échéant, dans les sous-régions, d'équipes multidisciplinaires permanentes de spécialistes, mentionnées dans la résolution précitée de la Conférence générale de l'OIT;
- e) le lancement d'expériences pilotes d'amélioration des conditions et du milieu de travail dans les zones rurales;
- f) l'inscription à l'ordre du jour de la prochaine session de la Commission consultative africaine de la question de l'amélioration des conditions et du milieu de travail.

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15 Novembre 1977

Monsieur Fortin
Directeur du Cabinet
Direction Générale du B.I.T.
CH 1211 GENEVE 22

Cher Ami,

Je vous fais parvenir, ci-joint, mon rapport de mission sur les conditions de travail dans l'agriculture en Côte d'Ivoire, une copie de la lettre d'I.W.A., ainsi que la copie de la lettre que j'adresse à Monsieur Blanchard.

J'espère qu'il n'en trouvera pas le ton trop grandiloquent ou familier, mais il me semble qu'il y a des moments difficiles où l'on a besoin que les gens qui vous entourent s'expriment simplement.

Je reste persuadé que malgré les difficultés qu'il rencontre, le P.I.A.C.T. demeure à terme une bonne carte de l'O.I.T.. Le P.I.A.C.T. Agriculture est lui-même ce qu'il y a de plus difficile dans le P.I.A.C.T., mais peut être aussi un élément positif du programme.

J'espère que vous serez à Manille et que je pourrai vous faire aimer quelques beaux paysages de cette région.

Bien amicalement.

A. Wisner

15 Novembre 1977

Monsieur Hellen
Chef du Service Hygiène et Sécurité
B.I.T.
CH 1211 GENEVE 22

Cher Monsieur,

Vous avez bien voulu à plusieurs reprises me considérer comme un collaborateur de votre service, et en particulier au cours de ma récente mission en Côte d'Ivoire.

C'est la raison pour laquelle je vous fais parvenir ci-joint mon rapport de mission, dans lequel vous trouverez quelques indications dans le domaine de l'hygiène et de la sécurité du travail.

Vous constaterez surtout la pauvreté des outils d'évaluation et d'action dont on dispose dans la domaine spécifique du travail en agriculture.

Malgré les difficultés dans lesquelles se trouve l'O.I.T., je suis persuadé qu'il est nécessaire de faire un effort particulier dans ce domaine quitte à ce que le financement des actions lourdes soit assuré par le P.N.U.D. ou la Banque Mondiale, à condition que le B.I.T. en reste le maître d'oeuvre.

Je vous prie d'agréer, Cher Monsieur, l'expression de mes sentiments dévoués.

A. Wisner

15 Novembre 1977

Monsieur Jain
Directeur Général Adjoint
B.I.T.
CH 1211 GENEVE 22

Monsieur le Directeur Général,

Je vous prie de trouver ci-joint le rapport de la mission P.I.A.C.T. Agriculture que j'ai accomplie l'été dernier en Côte d'Ivoire.

Le P.I.A.C.T. est difficile à promouvoir au sein du B.I.T.. Le P.I.A.C.T. Agriculture l'est encore plus mais sa nécessité me paraît également très grande.

Je crois que des possibilités d'action existent, mais elles sont trop coûteuses pour le budget du B.I.T., surtout dans la crise actuelle. Aussi me semble-t-il que là encore, plus qu'ailleurs, le rôle de l'U.N.D.P. et de la World Bank me paraît déterminant pour financer ce que le B.I.T. aura analysé et proposé.

Je vous prie d'agréer, Monsieur le Directeur Général, l'expression de mes sentiments dévoués.

A. Wisner

14 Novembre 1977

Monsieur le Gouverneur Nairay
Directeur du Cabinet
Présidence de la République
ABIDJAN
Côte d'Ivoire

Monsieur le Gouverneur,

J'aurais dû vous écrire dès mon retour pour vous remercier de l'accueil si bienveillant et si ouvert que vous m'avez réservé. Je voulais accompagner ma lettre de mon rapport de mission, ainsi ai-je été imprudent.

Les lourdes charges d'enseignement et de recherche qui sont les miennes dans une période économique et sociale difficile, la rédaction d'un important document pour une conférence du B.I.T. en Asie du Sud-Est m'ont empêché d'écrire mon rapport rapidement.

Je vous fais parvenir ce rapport de façon officieuse et sous une forme différente de celle sous laquelle vous le recevrez par les voies officielles. En effet le B.I.T. se réserve, de façon très légitime, le droit de ne transmettre les rapports que sous une forme qui lui convienne.

Le document ci-joint n'engage que moi. J'espère que vous y trouverez les ~~termes~~^{notes} de l'affection que je porte à la Côte d'Ivoire et du respect admiratif que j'ai acquis pour son Gouvernement. Je souhaite également que vous pardonniez toutes les naïvetés d'un travail trop rapide et superficiel.

Le présent rapport, sous sa forme actuelle, ne parviendra à personne d'autre que vous, en Côte d'Ivoire.

Je vous prie d'agréer, Monsieur le Gouverneur, avec mes remerciements, l'expression de mon respectueux dévouement.

A. Wisner

Copie : M. Fortin

14 Novembre 1977

Monsieur Blanchard
Directeur Général
B.I.T.
CH 1211 GENEVE 22

Monsieur le Directeur Général,

J'ai suivi avec beaucoup d'autres le combat si rude que vous avez mené pour conserver à l'O.I.T. son caractère universel, et j'ai appris avec une véritable tristesse la décision néfaste des Etats-Unis.

Je vous suis encore quand vous décidez de continuer à gouverner fermement, dans les conditions actuelles, cette organisation dont j'ai vu le caractère irremplaçable dans les pays en développement - et même aux Etats-Unis - comme en témoigne une lettre que j'ai reçue aujourd'hui d'une organisation syndicale et dont je vous joins une photocopie.

Je vous fais parvenir également le rapport sur les conditions de travail dans l'agriculture en Côte d'Ivoire. Vous y verrez les caractères indispensables de l'action du B.I.T., et des propositions que le P.N.U.D. et la Banque Mondiale pourraient financer si le B.I.T. n'était pas en mesure de le faire.

Je vous prie d'agréer, Monsieur le Directeur Général, l'expression de mon admiration et de mon respectueux dévouement.

A. Wisner

14 Novembre 1977

Monsieur Massun
Service des conditions
du travail et de vie
B.I.T.
CH 1211 GENEVE 22

Cher Ami,

Je vous fais parvenir ci-joint un exemplaire de mon rapport sur la Côte d'Ivoire qui a souffert de grands délais du fait de mon travail normal et de la double charge provenant du B.I.T. (Conférence de Manille).

Je ne pense pas que mes constatations et conclusions s'écartent ~~de~~ sensiblement de votre façon de voir. Je suis seulement très préoccupé de voir le B.I.T. malheureusement engagé vis-à-vis du Ministère du travail qui visiblement ne s'intéresse pas à l'agriculture.

J'espère que nous aurons bientôt l'occasion de discuter ensemble de ces questions.

Je vous remercie du rapport sur votre deuxième mission en Côte d'Ivoire et du projet de Mademoiselle Savignac qui me paraît excellent. Peut-être pourrait-on, toutefois, mettre en doute le titre général du projet car son travail portera sur une ethnie bien particulière (SENOUFOS) vivant dans des conditions économiques spécifiques. Il s'agira plutôt d'une monographie.

Je vous prie d'agréer, Cher Ami, l'expression de mes sentiments très cordiaux.

A. Wisner

14 Novembre 1977

Monsieur de Givry
Chef du Département des conditions
et du milieu de travail
B.I.T.
1211 GENEVE 22

Cher Monsieur,

Je vous prie de trouver ci-joint le rapport de la mission en Côte d'Ivoire que j'ai accomplie il y a trois mois.

J'ai présumé de mes capacités, en acceptant d'écrire, au moment de la rentrée Universitaire, la conférence que je dois faire à Manille et ce rapport.

Je dois dire que j'ai eu, en outre, des difficultés à mettre en ordre mes idées, compte tenu de la nouveauté des problèmes posés par les conditions de travail en agriculture.

Comme vous le verrez, un des points les plus sensibles est l'absence d'interlocuteurs organisés du point de vue gouvernemental, patronal et syndical.

Je serais particulièrement heureux s'il vous était possible de me faire savoir votre jugement sur mes propositions dans ce dernier domaine. Vous trouverez sans difficulté dans les propositions que je retiens, le double modèle français d'un secteur tripartite et d'un secteur bipartite (petits propriétaires).

Je sais ~~combien~~ combien le départ des Etats-Unis bouleverse le B.I.T., mais je n'ai pas cru devoir me limiter *pour au'ant* ~~pourant~~ dans les propositions relatives aux conditions de travail dans l'agriculture. Comme je l'écris, on peut penser qu'il sera possible de trouver un financement non B.I.T., dans ce domaine, et que nous pourrons dans ce cas agir comme un Bureau d'Etudes.

Je vous prie d'agréer Cher Monsieur, l'expression de mes sentiments dévoués.

A. Wisner

14 Novembre 1977

Monsieur Spyropoulos
Chef du service des conditions
du travail et de vie
B.I.T.
CH 1211 GENEVE 22

Cher Monsieur,

J'ai le plaisir - tardif - de vous faire parvenir ci-joint un exemplaire du rapport de ma mission en Côte d'Ivoire.

Je regrette mon retard dû à ma surcharge et aussi aux autres travaux faits pour le B.I.T.. Le délai est également dû au fait que le domaine des conditions du travail en agriculture est tout nouveau et qu'aucune structure lui correspondant n'était organisée en Côte d'Ivoire.

Comme vous le verrez, mes suggestions sont très peu académiques et peut-être jugerez-vous qu'il convient de les orienter autrement. J'avoue que je suis assez inquiet de ce que j'ai compris de la dernière visite de Monsieur Massün à Abidjan. J'ai l'impression que si le B.I.T. est contraint à négocier seulement avec le Ministère des Affaires Sociales et le Ministère du Travail, l'installation du PIACT en agriculture sera très difficile car c'est probablement au Ministère de l'Agriculture ou même à la Présidence que les décisions seront prises.

J'espère que j'aurai l'occasion de vous commenter à Manille les termes de ce rapport, sinon je me tiendrai à votre disposition pour vous en entretenir à Genève en Janvier.

.../...

Je vous prie d'agr er, Cher Monsieur, l'expressio
de mes sentiments d vou s.

A. Wisner

- N.B. - Je suis   votre disposition pour vous faire parvenir
le nombre de rapports n cessaire.
- Je vous ai adress , sous un autre pli, les documents
recueillis au cours de mon s jour, sauf le rapport
DREVET-SEDES qui est en possession de Monsieur Massun.

3 Novembre 1977

Monsieur Spyropoulos
Chef du Service des conditions de
travail et de vie
B I T
CH 1211 GENEVE 22

Cher Monsieur,

Je me réjouis de voir la préparation de la réunion de Manille se dérouler de façon satisfaisante. Je pense arriver samedi 3 Décembre à Manille, ou au plus tard dimanche 4. Je ne manquerai pas de prendre contact avec Monsieur Unni Nayar dès lundi matin 5, de telle sorte que je puisse travailler avec Monsieur Thurman et Mademoiselle Dy et vous rencontrer dès votre arrivée, le mardi 6. Je crains toutefois que l'effet de ce demi-tour de la terre ne vous gêne quelque peu pour ce premier jour de réunion.

Le rapport sur la mission en Côte d'Ivoire est quasi-terminé et je vous l'adresserai très prochainement.

J'avoue être quelque peu déçu du fait que les corrections indispensables n'ont pas pu être apportées à la version anglaise de mon texte. J'ai en effet fourni un effort considérable pour essayer de me faire parfaitement comprendre par le public anglophone et, pour tout dire, je n'ai pas été aidé par la traduction du BIT qui était franchement mauvaise.

Les corrections que je vous ai adressées sont indispensables à la compréhension de beaucoup de parties du texte, aussi je vous demande de bien vouloir adopter la solution que vous avez suggérée, et qui consiste à adjoindre à mon texte la liste des corrections que je demande. Il faudra certainement que le secrétariat fasse le travail nécessaire qui consiste à indiquer à quelle ligne de chaque page se situe la correction, et quelle est l'expression qui doit être remplacée par une autre.

.../...

Je suis désolé de cette situation mais, comme vous avez pu le noter, j'ai répondu dès le 7 Octobre à votre lettre du 5 en signalant que les corrections ne seraient pas négligeables, et j'ai adressé le 10 la copie annotée de la traduction en anglais avec cinq pages de corrections dactylographiées. Tout cela est donc arrivé deux mois avant le début de la conférence de Manille.

J'ai appris avec beaucoup de tristesse la décision des Etats-Unis. J'espère cependant que l'action diplomatique menée par la Direction du BIT permettra de limiter les dégats et, peut-être même, à terme, de retourner la situation.

Veillez agréer, cher Monsieur, l'expression de mes sentiments dévoués.

A. Wisner



INTERNATIONAL LABOUR OFFICE
BUREAU INTERNATIONAL DU TRAVAIL
OFICINA INTERNACIONAL DEL TRABAJO

Adresse postale CH-1211 GENÈVE 22
Télégrammes INTERLAB GENÈVE
Télex 22.271
Téléphone 98 52 11

PIACT 2-84-1
Réf. BIT/ILO n° PIACT 2-103
PIACT 4-1
Votre réf. n°

Professeur Alain Wisner,
Conservatoire national
des Arts et Métiers,
Département des Sciences
de l'Homme au Travail,
41, rue Gay-Lussac,
75005 PARIS

(France)

1 NOV 1972

Cher Monsieur,

Votre lettre du 7 octobre, qui a dû se croiser avec celle que je vous ai adressée le 13 octobre, a été reçue quelques heures avant mon départ pour Lima. A mon retour de Lima, j'ai pris connaissance de votre lettre du 14 octobre.

Il ne sera malheureusement pas possible d'apporter, au texte de votre rapport pour la réunion de Manille, les corrections que vous proposez, car le document était déjà reproduit et envoyé à Manille le jour-même où nous avons reçu votre lettre du 7 octobre. Je suis désolé pour ce contretemps, d'autant plus qu'il ne sera pas possible à notre service de reproduction de documents de procéder à un nouveau tirage de votre rapport. De toute façon, il s'agit de la traduction d'un texte et seul l'original en français fait foi. Cependant, si vous tenez absolument à ce que les corrections soient portées à la connaissance des participants, nous pourrions faire circuler un corrigendum.

Vous trouverez ci-joint un exemplaire de la version anglaise de ce rapport et dix exemplaires vous sont envoyés sous pli séparé. Notre stock est, pour le moment, limité et je préférerais attendre la réunion de Manille avant de vous faire parvenir quelques copies supplémentaires.

Ci-joint également un exemplaire de la version espagnole de ce document dont dix autres exemplaires vous sont adressés sous pli séparé.

ANNEXE
0298

ENVOI FAIT
SOUS PLI SÉPARÉ
SENT UNDER
SEPARATE COVER
REMITIDO APARTE

2

J'arrive à Manille le mardi 6 décembre dans le courant de l'après-midi et je prendrai contact avec vous dès mon arrivée. M. Thurman et Mlle Dy seront à Manille dès le 29 novembre pour préparer les deux réunions au sujet desquelles je vous envoie ci-jointes deux notes d'information ainsi qu'un exemplaire du rapport qui est soumis à la Commission consultative asiennne (voir chapitre IV) pour votre information. Vous recevrez ce dernier rapport sous pli séparé.

Nous serons, M. Thurman et moi-même, en contact avec le Ministère du Travail pour la préparation de la Conférence nationale tripartite. Quant aux consultations régionales qui précéderont la Conférence, je m'en occuperai personnellement en consultation avec M. Jain. Vous pourriez, de votre côté, profitant de votre présence à Manille quelques jours avant l'ouverture de la Conférence nationale tripartite, prendre contact avec les services et les personnalités intéressés aux questions évoquées dans votre rapport.

Quoi qu'il en soit, il serait utile que l'on se voie dès mon arrivée à Manille en présence des autres collègues et consultants pour discuter de l'organisation des deux réunions.

J'ai pris note du paragraphe de votre lettre concernant la préparation de votre rapport de mission en Côte-d'Ivoire et je comprends parfaitement bien les difficultés auxquelles vous vous heurtez pour la mise au point de ce rapport. J'espère que notre rencontre à Manille nous permettra d'évoquer cette question de vive voix.

Veillez agréer, cher Monsieur, l'expression de mes sentiments très cordiaux.



G. Spyropoulos,
Chef du
Service des conditions de travail
et de vie,
Département des conditions et
du milieu de travail.

20 Octobre 1977

Monsieur Farran
Directeur

Copie : Mr Devaux

Monsieur le Directeur,

Je participe depuis 1974, comme Conseiller du Directeur Général du Bureau International du Travail (BIT), à la préparation et à la réalisation du Programme International pour l'Amélioration des Conditions de Travail (PIACT). Monsieur Blanchard, Directeur Général du BIT, avait d'ailleurs écrit à Monsieur Citti pour le remercier de la contribution que le CNAM apportait ainsi à son Organisation.

Dans le cadre de cette activité qui demeure inscrite dans les limites de durée annuelle en usage dans l'enseignement supérieur, je suis invité à accompagner le Directeur Général du BIT à la Consultation Asienne sur les conditions de travail et les implications sociales du choix technologique, où je dois donner l'exposé introductif dont je vous joins un exemplaire.

Cette réunion aura lieu à Manille (Philippines). Je serai absent de Paris du 1er au 18 Décembre 1977; mes cours des lundis 5 et 12 Décembre seront assurés par Monsieur B. Pavard, maître-assistant; la direction du laboratoire sera assurée en mon absence par le Docteur Laville mon adjoint.

Je vous serais reconnaissant de bien vouloir me faire établir une autorisation d'absence pour cette période, compte tenu du fait que les frais de mission sont à la charge du BIT.

Veillez agréer, Monsieur le Directeur, l'expression de mes sentiments dévoués.

A. Wisner

20 Octobre 1977

SOCIETE GENERALE
37 rue Gay-Lussac
PARIS 5ème

Monsieur le Directeur,

Je vous serais reconnaissant de bien vouloir me faire établir des chèques de voyage pour un montant de 1.000 ₣ et mettre également à ma disposition une somme de 200 ₣ en espèces.

La contrepartie de cette somme est à prélever sur mon compte n° 5.060.071.8.

Au cas où cela paraîtrait nécessaire, je vous fais parvenir ci-jointe la photocopie du contrat de travail avec le B.I.T. qui précise les raisons de mon voyage et peut assurer au contrôle des changes français que, s'il va sortir de France 1.200 ₣, il en rentrera 2.812 de la part du B.I.T.

Veillez agréer, Monsieur le Directeur, l'expression de mes sentiments les meilleurs.

A. Wisner



EXTERNAL COLLABORATION CONTRACT

The International Labour Office (hereafter referred to as the ILO) and

Name in full : Professor A. Wisner

Address : Conservatoire national des Arts et Métiers
41 rue Gay-Lussac
75005 PARIS
France

(hereafter referred to as the external collaborator)

hereby agree as follows :

GENERAL CLAUSES

1. The external collaborator will perform for the ILO the work described in paragraph 14 of this contract, in accordance with the specifications and within the time limits set out in paragraph 13.
2. Upon completion of the work as provided for above to the satisfaction of the Director-General, the ILO will pay the external collaborator a fee of :

US\$2812.-- (Two thousand, eight hundred and twelve United States' dollars)

The external collaborator shall not in any circumstances be entitled to any payments other than those expressly provided for above. This fee will include any out-of-pocket expenses such as travel costs, stenographic expenses, etc.

3. Payment shall be effected in the following manner :

Lump sum on completion of the work on report.



4. In the event that the work provided for in this contract is unsatisfactory or fails to conform to the conditions set out above, the ILO reserves the right, as appropriate, to interrupt it, to request that it be corrected or modified, or to refuse to accept it. In such cases payment may be made in consideration of the work performed to the satisfaction of the Director-General.
5. The central aim of ILO publications policy is to facilitate objective study and analysis, as well as to spread knowledge and stimulate discussion, of the major social and economic problems and trends in the different countries of the world, and so to promote concrete national and international action in furtherance of the aims of the Organisation.

Because of their international character, ILO publications draw on experience in the widest possible range of countries and necessarily reflect thinking and practice in different political, social and economic systems. Every effort is made to give balanced coverage to countries at different stages of development and with widely divergent institutional and other characteristics.

In selecting for publication manuscripts which comply with these standards, the main criteria to be followed are factual accuracy, fair representation of different opinions, and the potential practical usefulness of the information and analysis contained therein.

This policy does not preclude the expression of views or opinions on controversial issues, but all authors of material to be published by the ILO must comply with the above standards and criteria; they must respect the international character of ILO publications, which may not be used for the advocacy or criticism of particular political systems or ideologies.

The responsibility for opinions expressed in signed articles, studies and other contributions rests solely with their authors and publication does not constitute an endorsement by the ILO of the opinions expressed in them.

No material shall be published which is in conflict with the aims and purposes of the Organisation.

6. The ILO reserves the right to propose alterations to manuscripts prepared by external collaborators in order to ensure respect for the principles set forth above, as well as the right to refuse these manuscripts without further obligation if agreement cannot be reached on the alterations proposed.
7. Copyright in the work produced in performance of this contract shall be vested in the ILO, which shall have the sole right to publish the same in whole or in part and to adapt and use it as may seem desirable. If the work is published, acknowledgement of authorship will be made in an appropriate form.
8. If the external collaborator desires to incorporate any previously published or unpublished material in the work, he shall obtain permission for its publication, use and adaptation from the persons in whom any existing copyrights therein may be vested and produce evidence to the ILO of such permission.
9. The external collaborator hereby warrants that he has the right to grant the copyright and other rights referred to in this contract and that he will indemnify the ILO against all damage (including any legal costs or expenses properly incurred) occasioned to the ILO should a third party successfully claim that copyright or one of the other rights mentioned in this contract is vested in him.
10. The external collaborator shall be solely liable for the payment of any national income tax due in respect of the emoluments payable under this contract.
11. In no circumstances shall the external collaborator be covered by ILO insurance, and it is his responsibility to take out, at his own expense, any personal insurance policies he may consider necessary, including a civil liability insurance policy.
12. This contract for external collaboration is entered into on the understanding that the external collaborator is an independent contractor and as such is not an official or employee of the ILO nor subject to the Staff Regulations of the ILO. Any dispute arising out of the application or interpretation of this contract shall be referred to the Administrative Tribunal of the ILO in accordance with the provisions of paragraph 4 of Article II of the Statute of the Tribunal.

SPECIAL CLAUSES

13. Time limits :

The work described below is to be completed not later than . . . for the report
on which date this contract shall expire.

31 October 1977 IN GENEVA

Consultancy - 15 December 1977

14. Nature of the work :

Preparation of report on training concerning technology and working conditions and serving as an ILO consultant for CONDI/T in the Philippines from 2 to 15 December 1977 for the Philippine National Tripartite Conference on Improving Working Conditions and Environment AND Asian Consultations on Working Conditions and Social Implications of Technological Choice.

Place and date

Paris 14 October 1977



(external collaborator)

Place and date

Geneva, 12 October 1977



G. Spyropoulos

(for the Director-General)

Copy reserved for
external collaboratorThe copies of this contract form are to be returned to the ILO (authorised signatory
above), duly signed for acceptance



INTERNATIONAL LABOUR OFFICE
BUREAU INTERNATIONAL DU TRAVAIL
OFICINA INTERNACIONAL DEL TRABAJO

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Télex 22.271
Téléphone 98 52 11

Réf. BIT/ILO n°

PIACT 4-1

Votre réf. n°

Prof. A. Wisner
Conservatoire national des arts et
métiers
Département des Sciences de l'Homme
au travail
41, rue Gay-Lussac
75005 PARIS

(France)

18 OCT 1977

Cher Monsieur,

Je vous remercie de votre lettre du 30 septembre me transmettant un exemplaire du document que vous avez préparé pour la réunion prévue à Manille en décembre prochain.

Il a retenu toute mon attention et je me suis réjoui notamment de l'équilibre et de l'esprit constructif avec lesquels vous avez présenté votre sujet. Comme il ressort du titre récent d'un ouvrage publié par la CFDT, "les dégâts du progrès", les dégâts qui se sont produits n'empêchent pas qu'ils sont le fruit d'un progrès. L'objectif est donc d'obtenir ce "progrès" avec moins de "dégâts", principalement pour ceux qui en sont les artisans directs.

J'espère vivement que les "entretiens de Manille" seront fructueux et qu'ils déboucheront sur des propositions d'action concrète dans cette région du monde.

Veuillez agréer, cher Monsieur, l'expression de mon très cordial souvenir.

J. de Givry
Chef du Département des conditions
et du milieu de travail.

13 Octobre 1977

Monsieur KimPheng Ouan
Güldenstr. 36
D 3300 BRAUNSCHWEIG
(R.F.A.)

Cher Monsieur,

Je vous félicite d'avoir repris vos études avec courage et succès et d'avoir entrepris une recherche sur un thème du plus haut intérêt.

Il se trouve que vous rejoignez mes préoccupations, comme en témoigne le texte d'une conférence que je vais prononcer à Manille en Décembre prochain et dont je vous joins un exemplaire. Vous y trouverez les résultats obtenus sur des Vietnamiens par le Docteur Thu (je vous adresse également la photocopie des articles d'où ces résultats sont extraits).

J'espère obtenir à Manille des renseignements précis sur les autres peuples de l'Asie du Sud-Est et je ne manquerai pas de vous les faire parvenir.

Je suis conseiller du Programme International pour l'Amélioration des Conditions de Travail (PIACT) au B.I.T. et je pense que votre étude pourra intéresser les responsables du PIACT. Je vous suggère d'en adresser un exemplaire à Monsieur Spyropoulos, Chef du Service des Conditions de Travail et de Vie au B.I.T. (CH 1211 GENEVE 22).

Veillez agréer, cher Monsieur, l'expression de mes sentiments les meilleurs.

A. Wisner

Braunschweig, le 29 septembre 1977

KimPheng Ouan
Güldenstr. 36
D- 3300 Braunschweig

A Monsieur

Wisner A.
Laboratoire de physiologie
du travail et d'ergonomie du
conservatoire national des Arts et Metiers
41, Rue Gay Lussac
75 Paris V

Cher monsieur Wisner

mon nom est KimPheng Ouan, je suis de nationalité Cambodgienne, réfugié politique en Allemagne de l'Ouest. Avec mon Baccalauréat de 2e. Partie, Serie Mathématique Elementaire au Lycée Descarte à Phnom-Penh, j'ai quitté mon pays en 1967 por poursuivre mes études, avec succès, a l'école de l'enseignement technique supérieur à Magdeburg.

Actuellement, j'étudie à l'université de Braunschweig à la Faculté de Sciences Economiques , j'achève mes études en écrivant une thèse.

Le thème de mon travail est sur l'étude ergonomique de la formation des outillages agricoles construites par les européens et utilisées dans les pays du Sud-Est asiatiques.

C'est pour cette raison, que je vous prie, cher monsieur, de me donner quelques informations traitants sur ce sujet. Jusqu'a maintenant, je n'ai pas pu trouver des renseignements anthropométriques et somatographiques sur les asiates de cette région.

Je vous remercie d'avance et vous serez très reconnaissant pour vos dérangements.

Je vous prie d'agréer, cher Monsieur, mes salutations les plus dinstingués.

Respectueusement

KimPheng Ouan



30 Septembre 1977

Monsieur Bernard Fortin
Directeur du Cabinet
Direction Générale du B.I.T.
CH 1211 GENEVE 22 (Suisse)

Cher ami,

Je suis confus de vous avoir dérangé au téléphone l'autre jour, car je sais combien les problèmes que vous traitez actuellement sont graves pour le BIT et, surtout, pour bien des travailleurs qui risquent de souffrir d'une décision négative des USA.

J'espère que vous trouverez une solution et qu'ensuite, avec Monsieur Blanchard, vous irez à Manille et que j'aurai le plaisir d'y passer quelques heures en votre compagnie.

Je vous fais parvenir ci-joint le texte qui m'a été demandé pour la réunion de Manille et qui sera la base d'une conférence que j'y prononcerai en anglais.

Je vous ferai parvenir prochainement le texte de mon rapport sur ma mission en Côte d'Ivoire qui soulignera l'extraordinaire difficulté d'agir sérieusement sur les conditions de travail en agriculture.

Veillez agréer, cher ami, l'expression de mes sentiments dévoués.

A. Wisner

30 Septembre 1977

Monsieur de Givry
Chef du Département des conditions
et du milieu de travail
B.I.T.
CH 1211 GENEVE 22
(Suisse)

Cher Monsieur,

J'ai été heureux que vous ayez pu trouver le temps de présider la réunion où j'ai rendu compte de ma mission en Côte d'Ivoire.

Je vous fais parvenir ci-joint le document que j'ai préparé pour la réunion sur les conditions de travail en Asie du Sud-Est qui aura lieu à Manille en Décembre prochain, et qui constitue la base de l'exposé que j'y ferai.

Veillez agréer, cher Monsieur, l'expression de mes sentiments dévoués.

A. Wisner

M-REBIFFE

à gater o ma lettre à SPYROPOULOS

(je ven appelle à ce propos directeur de CNAM
Marseille)

SRI LANKA

C.P.V.C.
D^r PINNABODA

Specialist research officer
Occupational Health

INDIA

D^r P.N. SAHA

Deputy Director (Physiology)

Central Labour Institute

BOMBAY 400.027

D^r P.N. SEN

Department of PHYSIOLOGY

UNIVERSITY OF CALCUTTA

11A MOHAN BAGAV LANE
CALCUTTA 700.004

~~D^r P.N. NAG~~

Occupational Physiology Division
National Institute of Occupational Health
MEGHANINAGAR AHMEDABAD 340 006
INDEC

13 Juin 1977

Monsieur de Givry
Chef du Département des conditions
et du milieu de travail
B.I.T.
CH 1211 GENEVE 22
(Suisse)

Cher Monsieur,

Je vous prie de trouver ci-joint le rapport sur la mission que vous m'avez confiée aux Philippines en Février 1977. Je regrette vivement mon retard, malheureusement la lourdeur de mes charges et mon état de santé ne m'ont pas permis de faire mieux dans les conditions difficiles que connaissent actuellement la France et l'Europe Occidentale.

J'ai fait parvenir également ce rapport à Monsieur Blanchard et à Monsieur Jain, dans la mesure où ils ont bien voulu s'intéresser à cette mission. Je me suis permis d'attirer leur attention sur le fait que la pleine efficacité du PIACT ne pourrait être atteinte que dans la mesure où nous pourrions distinguer entre les pays en développement industriel en fonction de leurs caractéristiques économiques et sociales, et de leur richesse en experts.

Je vous remercie de continuer à m'accorder votre confiance et j'espère avoir l'occasion de vous voir prochainement à Genève, à l'occasion de la préparation de ma prochaine mission orientée vers les conditions de travail en agriculture.

Veillez agréer, cher Monsieur, l'expression de mes sentiments dévoués.

A. Wisner



**PHYSIOLOGIE DU TRAVAIL
ERGONOMIE**

Paris, le 23 Juin 1977

Monsieur de Givry
Chef du Département des conditions
et du milieu de travail
B.I.T.
CH 1211 GENEVE 22
(Suisse)

Cher Monsieur,

Je vous prie de trouver ci-joint le rapport sur la mission que vous m'avez confiée aux Philippines en Février 1977. Je regrette vivement mon retard, malheureusement la lourdeur de mes charges et mon état de santé ne m'ont pas permis de faire mieux dans les conditions difficiles que connaissent actuellement la France et l'Europe Occidentale.

J'ai fait parvenir également ce rapport à Monsieur Blanchard et à Monsieur Jain, dans la mesure où ils ont bien voulu s'intéresser à cette mission. Je me suis permis d'attirer leur attention sur le fait que la pleine efficacité du PIACT ne pourrait être atteinte que dans la mesure où nous pourrions distinguer entre les pays en développement industriel en fonction de leurs caractéristiques économiques et sociales, et de leur richesse en experts.

Je vous remercie de continuer à m'accorder votre confiance et j'espère avoir l'occasion de vous voir prochainement à Genève, à l'occasion de la préparation de ma prochaine mission orientée vers les conditions de travail en agriculture.

Veillez agréer, cher Monsieur, l'expression de mes sentiments dévoués.

A. Wisner

13 Juin 1977

Copie : Mr Fortin

Monsieur Jain
Directeur Général Adjoint B.I.T.
CH 1211 GENEVE 22
(Suisse)

Monsieur le Directeur Général,

Je vous prie de trouver ci-joint le rapport que j'ai rédigé à la suite de la mission qui m'a été confiée par le B.I.T. aux Philippines en Février 1977, et dont j'ai eu l'occasion de m'entretenir avec vous à Genève et à Paris.

J'ai formulé un nombre important de recommandations qui reposent toutes sur des demandes de groupes ou de personnalités représentatives, mais ces propositions doivent naturellement être transformées en fonction des perspectives du B.I.T. et des possibilités de financement.

Il m'est apparu également que le PIACT ne pouvait trouver sa pleine efficacité que dans la mesure où il s'adaptait correctement aux besoins très différents des pays en développement industriel, en fonction de leur état économique et social et de leur richesse plus ou moins grande en compétence.

Veillez agréer, Monsieur le Directeur Général, l'expression de mes sentiments dévoués.

A. Wisner

13 Juin 1977

Copie : MM. Fortin
de Givry
Spyropoulos

Monsieur Blanchard
Directeur Général du B.I.T.
CH 1211 GENEVE 22
(Suisse)

Monsieur le Directeur Général,

Je vous prie de trouver ci-joints le rapport et les annexes que j'ai rédigés sur la mission que le B.I.T. a bien voulu me confier en Février dernier aux Philippines, et dont je vous ai rendu compte oralement au cours de l'audience que vous m'avez accordée le 30 Mars.

Une partie des précisions que j'ai apportées dans ce rapport sont destinées au dossier que vos Services préparent pour la visite que vous avez décidé de faire dans ce pays, en Décembre 1977.

Veillez agréer, Monsieur le Directeur Général, l'expression de mes sentiments dévoués.

A. Wisner

13 Juin 1977

Monsieur Fortin
Directeur du Cabinet
Direction Générale du B.I.T.
CH 1211 GENEVE 22
(Suisse)

Cher ami,

Je vous adresse ci-joint le rapport que j'ai rédigé sur ma mission 1977 aux Philippines, ainsi que le double des lettres d'accompagnement que j'adresse à Messieurs Blanchard et Jain.

Je suis très en retard dans cette rédaction mais j'ai eu beaucoup de mal à classer la grande masse de faits que j'avais recueillis, puisqu'il me fallait en même temps fabriquer le classement.

Ce qui me paraît, à la réflexion, le plus urgent, c'est de démembrer la catégorie trop vaste de pays en développement industriel, car les relations du BIT ne peuvent pas être identiques pour la centaine de pays qui entrent dans cette catégorie.

Aux Philippines par exemple, il existe un grand nombre de personnes compétentes mais le BIT peut avoir un grand rôle pour leur donner des moyens de recherche et de travail et, surtout, les mettre en communication entre elles et avec le Gouvernement et l'industrie.

Dans d'autres pays, comme l'Indonésie, il y a un manque évident d'experts appartenant au pays, et un travail de suppléance doit être assuré par les ergonomistes internationaux.

.../...

J'espère un jour pouvoir préparer une taxonomie des pays en développement industriel mais je crains d'être trop inégal à cette tâche difficile. Il faudra probablement organiser sur ce sujet une petite réunion avec des économistes et des sociologues.

Veillez agréer, cher ami, l'expression de mes sentiments dévoués.

A. Wisner

27 Mai 1977

Mr Unni Nayar
Director ILO AREA OFFICE
P.O. Box 2.965
MANILA
(Philippines)

Dear Mr Unni Nayar,

I am sorry to be so late in thanking you for all you did for us when Miss Dy and I were in the Philippine. It was so precious for us specially because your friendship put a special dimension in all our relations.

I thank you also for your letter of 15 March and all the documents joined to your message. This is a great help in the redaction of my report. I am little late in my writing but I must say that the harness of which you speak in your letter is really heavy related to the difficult economic situation of western Europe and specially of my country, and also to the success of our teaching : we have visiting professors and students staying for a year or two and coming from Algeria, Brasil, Canada, Chili, Sweden ... but we have also to care of the French ...

I hope to come back soon in the Philippine, perhaps with Mr Blanchard if he visits the country in next October as he has promised to President Marcos and Secretary Oplé. Perhaps also an area meeting of experts could be organized at this occasion in Manila, but this is not yet decided and if it is, Mr Karasaki will perhaps suggest Bangkok.

I have seen Mr Jain in Geneva as you suggested me. It was an extremely interesting discussion that was continued during an half day in Paris, where Mr Jain was for another reason. You may be sure that Mr Jain as a high opinion of your person ... and he is right.

.../...

I send you, under the same cover, a letter and C.V. of Mr Aniceto Balaba. He is a very nice and dynamic man and he wants strongly to work with I.L.O. I am not sure that he has a very high intellectual level, but he may be used perhaps as an I.L.O. expert in the practical fields of adult training and labor regulation enforcement. I have no special relation with him but I always try, during my travel, to find some interesting people who could help ILO in different areas.

Monsieur G. Spyropoulos

Chef du Service des conditions de travail et de vie

I hope to see you again soon.

Truly yours,

CH 1211 GENEVE 22

Cher Monsieur,

Je suis confus de mes 6 semaines de retard, mais le travail qu'a nécessité ce rapport a été très supérieur à ce que j'imaginai (environ 3 semaines à plein temps).

A. Wisner

C'était en effet la première fois que j'étais à même de saisir la situation d'un pays dans le cadre du P.I.A.C.T. et je n'avais pas les cadres de références pour classer mes idées; j'ai dû les constituer de façon plus ou moins heureuse.

Il me semble également que cette mission était pour moi l'occasion de réfléchir à nouveau sur la classification des pays en développement, les ~~particularités~~ *particularités* et les moyens du P.I.A.C.T.

Là encore, ma réflexion est bien limitée.

Je vous envoie, ci-joint, les annexes du rapport, et sous un autre pli quelques documents intéressants que j'ai rapportés des Philippines.

J'ai terminé la rédaction du rapport et sa frappe est très avancée. Vous devriez en recevoir un exemplaire au début de la semaine prochaine.

Veillez agréer, cher Monsieur, l'expression de mes sentiments dévoués.

A. Wisner

*Je joins également à cette lettre une liste d'experts
soumis retardés sur un
document.*

INTERNATIONAL LABOUR OFFICE



BUREAU INTERNATIONAL DU TRAVAIL

GENÈVE

DEPUTY DIRECTOR GENERAL

DIRECTEUR GÉNÉRAL ADJOINT

Prof. A. Wisner,
Département des Sciences de
l'Homme au Travail,
Conservatoire National des
Arts et Métiers,
41, rue Gay-Lussac,
F-75005 PARIS.

(France)

Ref.: PIACT 4-1

Dear Professor Wisner,

73 MAY 1977

Thank you very much indeed for your kind letter of 28 April and its enclosure. I have noted with much interest your comments on the work of Mr. P.K. Nag of the University of Calcutta, and am pleased to know that his work meets the high standards of research required in this difficult field. I am drawing Mr. de Givry's attention to this work.

May I take this opportunity to thank you most sincerely for the time you spent with me and for the valuable explanations you provided both about your work and about certain broader aspects of social policy implicit in this relatively new field of applied research. We look forward to continued collaboration with you. Please also accept my thanks for your hospitality.

With kind regards,

Yours sincerely,

A handwritten signature in blue ink, appearing to be 'S.K. Jain', is written over a horizontal line.

S.K. Jain,
Deputy Director-General.

V#
260305Z PARIS F
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MAMILA 29/28 25 1440

LT
PROF A WISNER
PHYSIOLOGIE DU TRAVAIL CNAM
41 RUE GAY LUSSAC
75005 PARIS

YURLET 7 JANUARY GOVERNMENT APPROVES MISSION GRATEFUL
RECONFIRM TRAVEL SCHEDULE
UNNI NAYAR IMTERLAB MANILA 018

COL FULLRATE PROF A WISNER 41 75005 7 018
PLS RECTIFY CLASS FULLRATE NOT LT.....

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Copie à M. WISNER

24 JAN. 1977

N/Réf : Sec. Dir/MD/n°00389

PERS

Monsieur Francis BLANCHARD
Directeur Général
Bureau International du Travail
Genève

SUISSE

Monsieur le Directeur Général,

Vous avez bien voulu par votre lettre en date du 20 décembre 1976 m'informer du très vif intérêt que le Bureau International du Travail accorde aux travaux du Professeur WISNER. Je m'en réjouis d'autant plus que M. WISNER est une personnalité exceptionnelle qui fait honneur à notre Etablissement et à notre pays.

Je sais aussi l'importance que votre organisme a sur le plan international et l'aide décisive qu'il apporte aux pays du Tiers-Monde.

Je faciliterai donc au maximum la tâche du Professeur WISNER pour qu'il puisse continuer à vous seconder au mieux dans votre si difficile mission.

Je vous prie de croire, Monsieur le Directeur Général, à l'assurance de ma considération la plus distinguée.

Le Directeur,

signé : L. CITTI

L. CITTI



BUREAU INTERNATIONAL DU TRAVAIL
GENÈVE

LE DIRECTEUR GÉNÉRAL

le 20 décembre 1976

9
APPRÉHÉ le
7 1976
CÉLÉBRE DIRECTEUR

Monsieur le Directeur,

Vous savez que votre éminent collaborateur, le Professeur Wisner, a été associé depuis plusieurs années aux activités qu'entreprend l'Organisation internationale du Travail dans le domaine des conditions de travail.

Je tiens à vous remercier très vivement des facilités que vous avez bien voulu accorder au Professeur Wisner pour exécuter les activités internationales qui lui ont été ainsi confiées. La qualité exceptionnelle de la contribution d'A. Wisner a été vivement appréciée dans les Etats membres qui ont bénéficié de son concours. J'ajoute que les contacts que j'ai, ainsi que mes collaborateurs, avec A. Wisner sont pour le Bureau une source constante d'inspiration et d'enseignement.

J'ai l'intention de confier au Professeur Wisner, au début de l'année prochaine, une importante mission aux Philippines. Le Ministre du Travail de ce pays, qui est un homme d'action et de progrès, se félicite particulièrement de ce choix. Je ne doute pas que cette mission, comme les précédentes, ne soit couronnée de succès.

En vous remerciant à nouveau de bien vouloir faciliter l'activité internationale du Professeur Wisner, je vous prie d'agréer, Monsieur le Directeur, l'assurance de ma considération très distinguée.


Francis Blanchard

Monsieur Citti,
Directeur,
Conservatoire national des arts et métiers
41, rue Gay-Lussac
75005 - Paris

Cher ami,

Ci-joint, par un ami, copie de
la lettre que

Bernard Fortin M. Mandat

Directeur du Cabinet du Directeur général vient de
recevoir de votre Directeur.

Très cordialement à vous,

Alfred Pictet

1211 Genève 22

Bureau international du Travail



CONSERVATOIRE NATIONAL DES ARTS ET MÉTIERS

Paris, le 24 JAN. 1977

Le Directeur

N/Réf : Sec. Dir/MD/n°000389

Pers./

Monsieur Francis BLANCHARD
 Directeur Général
 Bureau International du Travail
 Genève

SUISSE

Monsieur le Directeur Général,

Vous avez bien voulu par votre lettre en date du 20 décembre 1976 m'informer du très vif intérêt que le Bureau International du Travail accorde aux travaux du Professeur WISNER. Je m'en réjouis d'autant plus que M. WISNER est une personnalité exceptionnelle qui fait honneur à notre Etablissement et à notre pays.

Je sais aussi l'importance que votre organisme a sur le plan international et l'aide décisive qu'il apporte aux pays du Tiers-Monde.

Je faciliterai donc au maximum la tâche du Professeur WISNER pour qu'il puisse continuer à vous seconder au mieux dans votre si difficile mission.

Je vous prie de croire, Monsieur le Directeur Général, à l'assurance de ma considération la plus distinguée.

Le Directeur,


 L. CITTI

4th November 1977

RAFFLES HOTEL
1/3 Beach Road
SINGAPORE

Sir,

I will arrive at SINGAPORE from EUROPE by SABENA flight SN 287 at 2.10 pm Friday December the 2nd.

Would you reserve me a room for one person with bath and view on the sea for the night 2nd/3rd December ?

Truly yours.

Professor A. Wisner

A confirmation would be agreeable.

4th November 1977

Copie : Mr UNI NAYAR

BAY VIEW PLAZA HOTEL

Roxas Boulevard

ERMITA-MANILA

Philippines

Sir,

I will arrive at MANILA from EUROPE and SINGAPORE by SINGAPORE AIR LINES flight SQ 66 at 1.20 pm Saturday December the 3rd and I will stay approximatively two weeks.

Would you reserve me a room for one person with bath for this periode in your hotel ?

I will be in PHILIPPINES a consultant to I.L.O. (International Labour Office) a U.N. Agency and I hope you will let me benefit of the special conditions you offer to U.N. experts.

A confirmation with prices for bed and breakfast would be agreable.

Truly yours

Professor A. Wisner

4th November 1977

Monsieur N. UNNI NAYAR
Director
International Labour Organisation
(I.L.O.)
B.P. 2965
MANILA
Philippines

Dear Mr Unni Nayar,

I enjoy the idea that, in less than a month, I will be again in MANILA for a few very interesting I.L.O. conferences and also - may I say and more - for a new occasion of pleasant meetings with yourself and our philipinese friends.

I hope you have received now the text of my paper that will be distributed. The translation in english is alas ! full of ~~my~~ mistakes.

I send under this cover a copy of a letter I send to BAYVIEW PLAZA HOTEL. Would you ask your secretary to control this reservation. In fact, I am not yet absolutely sure to arrive on Saturday. I will, perhaps, be obliged to fly only Sunday from SINGAPORE.

Truly yours.

A. Wisner

I have prepared some slides 2" X 2" for my speech. Do you think, I will have a projector in the conference room ?

INFORMATION NOTE

Philippine National Tripartite Conference on
Improving Working Conditions and Environment

In "Making Work More Human", his report to the 1975 International Labour Conference, ILO Director-General Francis Blanchard called for a significant new action programme to improve working conditions and environment. Following the unanimous endorsement of this appeal by the Conference, and based on a series of preparatory consultations throughout the world, the ILO established the International Programme for the Improvement of Working Conditions and Environment (PIACT, from the French initials of the programme). PIACT uses a variety of means of action in order to assist countries to set national priorities and develop programmes for improvements in working conditions and the safety and health of workers.

Based on a request from the Philippine Department of Labor and subsequent discussions with Secretary Ople and other government, employer, worker and academic representatives, the ILO is providing technical support to the development of a PIACT-oriented national policy for the Philippines. The development of this policy and the action programmes which it will include is the purpose of the Philippine National Tripartite Conference on Improving Working Conditions and Environment.

The decision to hold a National Tripartite Conference follows two visits by PIACT experts. The Conference is the subject of extensive preparations both in the Philippines and on the part of ILO staff and expert consultants in Geneva and Asia.

The Conference is expected to gather about seventy-five high-level participants, including government, employer and worker participants, contributors to technical reports, ILO staff and consultants and invited observers. It will be held at the Philippine International Convention Center from 12 to 14 December 1977.

The Conference is being sponsored by the Department of Labor of the Philippines. The ILO, as co-sponsor, will be providing a series of technical reports and the services of ILO staff and consultants.

The Conference will include three Committees, each of which will discuss two agenda items and report to the plenary. These agenda items are as follows:

- (a) - the use of technology for the improvement of working conditions and environment;
- the contribution of various forms of training to the improvement of working conditions and environment;

- (b) - enterprise-level action to improve working conditions and environment;
 - working conditions and environment and productivity;
- (c) - labour standards on working conditions and environment and their enforcement; and
 - national policies and machinery for the improvement of working conditions and environment.

The discussion of these agenda items is to lead to the preparation of a report by the Department of Labor of the Philippines containing policy and action proposals.

The Philippine National Tripartite Conference on Improving Working Conditions and Environment will follow the 17th Session of the ILO's Asian Advisory Committee in Manila (28 November to 8 December 1977) which will consider placing PIACT on the agenda of the next Asian Regional Conference of the International Labour Organisation. It will also follow ILO-sponsored Asian Consultations on Working Conditions and Environment and Choice of Technology (9 and 10 December 1977). The proximity of these three events has been designed to allow considerable scope for cross-fertilisation with a view to the development of PIACT throughout Asia.

The working language of the Conference will be English. The background working documents will be distributed to participants approximately one week before the Conference begins. Practical arrangements concerning the Conference are being made by the Institute of Labor and Manpower Studies of the Department of Labor of the Philippines.

12.10.77

INFORMATION NOTE

Asian Consultations on Working Conditions and Choice of Technology

In "Making Work More Human", his report to the 1975 International Labour Conference, ILO Director-General Francis Blanchard called for a significant new action programme to improve working conditions and environment. Following the unanimous endorsement of this appeal by the Conference, and based on a series of preparatory consultations throughout the world, the ILO established the International Programme for the Improvement of Working Conditions and Environment (PIACT, from the French initials of the programme). PIACT uses a variety of means of action in order to assist countries to set national priorities and develop programmes for improvements in working conditions and the safety and health of workers.

The launching of PIACT in Asia, which requires the development of practical policies and action programmes appropriate to the priorities and concrete problems of Asian member States of the ILO, raises considerable practical and technical problems. Regional tripartite consultations (including those held in Bangkok in February 1976) proved invaluable in the preliminary design of PIACT.

An event of considerable importance in the launching of PIACT in Asia is to occur in Manila late in 1977. From 12 to 14 December, the Department of Labor of the Philippines is sponsoring a National Tripartite Conference on Improving Working Conditions and Environment. Moreover, the Asian Advisory Committee of the ILO, meeting from 28 November to 8 December, will consider PIACT as a possible agenda item for the next Asian Regional Conference of the International Labour Organisation. This concurrence of events provides an opportunity for consultations among members of the Asian Advisory Committee and the ILO staff and consultants who will be present for the Philippine National Tripartite Conference. It has therefore been decided to hold the Asian Regional Consultations on Working Conditions and Choice of Technology. These Consultations will be held on 9 and 10 December 1977 at the Philippine International Convention Center. The participants at the Consultations will be a tripartite delegation of members of the Asian Advisory Committee plus a tripartite group of expert consultants. In addition to ILO staff and consultants, contributors to the Philippine National Tripartite Conference and representatives of other agencies will be present as observers.

The agenda of these Asian Consultations will include two items. The first will be "Means for promoting PIACT objectives in Asia". The purpose of the discussion on this

item will be to generate ways of making PIACT concrete, practical and effective in the Asian context. The second agenda item will concern "Working conditions and choice of technology". This item, which covers a new area of research and action for the ILO, is based on findings that technological alternatives can be used to generate significantly better conditions for workers.

Preparations for the Consultations are being made by the Working Conditions and Environment Department of the ILO in co-operation with the ILO Area Office in Manila.

12.10.77

7 Octobre 1977

Monsieur G. Spyropoulos
Chef du Service des Conditions
de travail et de vie
B.I.T.
CH 1211 GENEVE 22

Cher Monsieur,

Je vous remercie de m'avoir fait parvenir *la traduction*
~~du~~ rapport que j'ai rédigé pour la réunion de Manille.
Comme je m'y suis engagé je vous le renvoie par retour
de courrier avec les corrections que je suggère et qui
ne sont pas négligeables.

Je vous serais reconnaissant de bien
vouloir me faire parvenir 30 exemplaires du texte
anglais ainsi que du texte espagnol car cela pourrait
m'être utile pour nos visiteurs étrangers.

Je vous remercie de m'envoyer prochainement
mon contrat de mission pour les Philippines. J'espère que
vous voudrez bien considérer le rapport que j'ai préparé
à l'avance comme le seul document que je vous dois pour
cette mission, car je suis quelque peu submergé par les
textes à écrire pour le P.I.A.C.T..

J'ai l'intention de partir de Paris le Jeudi
1er décembre au soir et de passer 1 ou 2 jours à Singapour
pour arriver le 4 ou le 5 à Manille. Je pourrai donc contri-
buer à la préparation des réunions. Je pense repartir le 17
ou le 18 et participer ainsi à la mise au point des conclusions.

Il n'est pas nécessaire de prévoir une avance
sur frais de mission car cela complique la comptabilité du
B.I.T. et ne m'est pas nécessaire en ce moment.

.../...

Je serais heureux que mon billet soit à ma disposition à Paris, dans une agence de voyage (Cook ou American Express) plutôt que dans une compagnie aérienne moins souple pour les trajets utilisant les services de plusieurs compagnies.

Je vous prie d'agréer, Cher Monsieur,
l'expression de mes sentiments dévoués.

A. Wisner

N.B. - Je n'ai pas encore reçu le règlement de ma consultation à Genève, du 21 Septembre.



INTERNATIONAL LABOUR OFFICE
BUREAU INTERNATIONAL DU TRAVAIL
OFICINA INTERNACIONAL DEL TRABAJO

Adresse postale CH-1211 GENÈVE 22
Télégrammes INTERLAB GENÈVE
Télex 22.271
Téléphone 98 52 11

Réf. BIT/ILO n° PIACT 2-84-1

Votre réf. n°

Professeur A. Wisner
Conservatoire national des Arts
et Métiers
41, rue Gay-Lussac
75005 PARIS,

(France)

- 5 OCT 1977

Cher Monsieur,

Votre excellent rapport sur les choix de technologies et les conditions de travail a déjà été traduit en anglais. Je vous transmets ci-joint une copie du texte anglais. L'original a été envoyé au service des documents pour être reproduit en plusieurs exemplaires.

Votre contrat pour la mission aux Philippines est en cours de préparation et vous sera envoyé la semaine prochaine.

Je vous prie d'agréer, cher Monsieur, l'expression de mes sentiments très cordiaux.

Pour le Directeur général:

G. Spyropoulos,
Chef du
Service des conditions de travail
et de vie,
Département des conditions et
du milieu de travail.

14 Octobre 1977

Monsieur G. Spyropoulos
Chef du Service des conditions de
travail et de vie
B I T
1211 GENEVE 22 (Suisse)

Cher Monsieur,

Je vous prie de trouver ci-jointes les deux copies du contrat que vous avez bien voulu me faire parvenir. Ce contrat me convient parfaitement, compte tenu des explications que votre secrétaire a bien voulu me donner.

Je vous ai envoyé, le 10 Octobre, la copie de la traduction en anglais de mon exposé de Manille, avec des corrections qui ne sont malheureusement pas négligeables.

Je comprends parfaitement votre désir de disposer rapidement du rapport sur ma mission en Côte d'Ivoire. Celui-ci est déjà à demi rédigé et vous parviendra d'ici deux semaines. Je n'ai pu faire plus vite car je devais, dans la même période, rédiger la version française de mon exposé de Manille et consacrer un temps important à la révision du texte anglais. Comme vous le savez, j'ai par ailleurs de nombreuses obligations professionnelles.

Les difficultés que vous avez rencontrées cette année avec les retards de mes textes montrent bien qu'il est au-delà de mes capacités de consacrer au BIT, non pas tellement le temps des missions mais le temps nécessaire à la rédaction des rapports. C'est la raison pour laquelle je pense que, pour les années ultérieures, il faudra prévoir soit une réduction de ma contribution au PIACT, soit des missions dont la nature exigera une contribution écrite de moindre importance.

Veillez agréer, cher Monsieur, l'expression de mes sentiments dévoués.

A. Wisner



INTERNATIONAL LABOUR OFFICE
BUREAU INTERNATIONAL DU TRAVAIL
OFICINA INTERNACIONAL DEL TRABAJO

Adresse postale CH-1211 GENÈVE 22
Télégrammes INTERLAB GENÈVE
Télex 22.271
Téléphone 98 52 11

PIACT 2-84-1
Réf. BIT/ILO n° PIACT 2-103
Votre réf. n° PIACT 4-1

Professeur Alain Wisner,
Conservatoire national des
Arts et Métiers,
Département des Sciences
de l'Homme au Travail,
41 rue Gay-Lussac,
75005 PARIS

(France)

13 OCT 1977

Cher Monsieur,

Je vous prie de trouver ci-joint, en trois exemplaires, un contrat de collaboration extérieure concernant votre participation aux réunions de Manille. Je vous serais reconnaissant de bien vouloir signer les deux copies de ce contrat et de me les retourner.

Dès réception des copies signées par vous, nous vous verserons la totalité de la somme fixée dans le contrat afin de vous permettre d'acheter votre billet d'avion pour Manille.

Le contrat couvre vos frais de voyage, les indemnités journalières pour un séjour de quatorze jours à Manille (du 2 au 15 décembre) ainsi qu'une somme de quatre cents dollars représentant les honoraires pour votre rapport.

Ce rapport a maintenant été traduit en anglais et en espagnol. Je vous ai déjà envoyé une copie du projet du texte anglais et vous ferai parvenir, dès sa parution, un exemplaire ronéoté de cette version. Quant à la version espagnole, j'espère pouvoir vous en faire parvenir un exemplaire après le séminaire du PIACT à Lima (du 17 au 21 octobre 1977).

Nous sommes actuellement en train de mettre au point les arrangements administratifs et techniques concernant les deux réunions qui auront lieu à Manille et nous vous ferons parvenir d'ici trois ou quatre semaines une série de notes concernant ces deux réunions. Vous recevrez également au fur et à mesure les différents rapports préparés pour les deux réunions de Manille. Il faut cependant s'attendre à ce que certains de ces documents -notamment ceux préparés par les experts philippins- ne soient pas disponibles avant votre départ de Paris.

Je saisis l'occasion pour vous demander si vous avez pu trouver le temps de rédiger votre rapport sur la mission que vous avez effectuée en Côte-d'Ivoire. M. Massün vient de rentrer de Côte-d'Ivoire et est actuellement en train de préparer son propre rapport de mission dont vous recevrez copie. Il importe cependant que nous soyons en possession de votre rapport de mission pour les suites que nous déciderons de donner à nos activités en Côte-d'Ivoire.

Je vous prie de croire, cher Monsieur, à l'expression de mes sentiments très cordiaux.



G. Spyropoulos,
Chef du
Service des conditions de travail
et de vie,
Département des conditions et
du milieu de travail.



ROBERTO PREGARZ
MANAGER

RAFFLES HOTEL
SINGAPORE

TELEX RS 21586
CABLE: "RAFLOTEL"
TEL. 328041 (9 LINES)
ADD 1-3 BEACH ROAD
SINGAPORE 7

7th November 1977

Mr A Wisner
Conservatoire National des Arts et Metiers
41, Rue Gay-Lussac
75005 Paris

Dear Mr. Wisner,

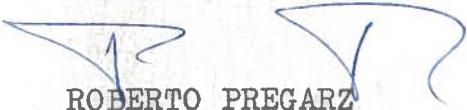
Thank you for your letter dated 4th November 1977.

We have much pleasure in confirming your reservation for a single room for your goodself from 2 to 4 December 1977.

The daily room rate is S\$70.00 plus 3% Government tax.

We look forward to your stay with us at the Raffles.

Yours sincerely,


ROBERTO PREGARZ
Manager

INTERNATIONAL LABOUR ORGANISATION

INTERNATIONAL PROGRAMME FOR THE IMPROVEMENT
OF WORKING CONDITIONS AND ENVIRONMENT (PIACT)

Philippine National Tripartite Conference on Improving
Working Conditions and Environment

(Manila, 12 to 14 December 1977)

Working Document No. 3

Information and Training Needs for Choice
of Technology and Working Conditions

by

A. Wisner

Professor of "Physiologie du Travail et Ergonomie" at
the Conservatoire National des Arts et Métiers
Paris, France

Geneva
International Labour Office
1977

1.0 INTRODUCTION

Working and living conditions depend on numerous decisions taken in every country by all kinds of authorities for a wide variety of reasons. On the conditions thus determined the country's immediate future will be built; they are the foundation of its economic and social progress.

Twenty years ago it was generally accepted that all countries of the world could easily be classified according to the single criterion of per capita revenue. This was taken to be the essential - perhaps the only - gauge of economic and social success. Thus the most industrialised countries were taken as a standard of comparison for all the others.

But Gross Domestic Product (G.D.P.) and its offshoot per capita G.D.P. are only an index of commercial activity - an imperfect index even in an industrialised country, ignoring as it does the economic activities of mothers and (largely) of old-style farmers. It becomes grossly inaccurate in countries not yet fully industrialised, where non-commercial economic activities linked to the traditional system are still by far the most common. Describing economic developments in terms of per capita G.D.P. thus tends to ascribe too much importance to greater commercial production and hide any fall that may take place in non-commercial production at family or village level; it tends, that is, to highlight the advantages

of industrialisation to the national economy but not the harm it does to the life of the individual.

As industrialisation spreads throughout the world it becomes clear that assessing its effects is an extremely complex matter. Some countries have reached a very high G.D.P., but signs of social dissatisfaction in them increase and multiply as old production systems break down or new ones turn out to be less perfect than they looked at first. In other countries economic growth benefits only a minority - the middle classes, or more generally speaking, town dwellers. All too often the peasants - who are still three-quarters of the population of the world - lead a no less miserable existence than before, or are still further impoverished.

The very way in which industrialisation takes place is often questioned. Some countries give priority to heavy industry; in the long run it leads to economic independence, but often at the price of crushing indebtedness which in the short run keeps down the levels of living of most of the urban and peasant population. Other countries welcome foreign investment in their agriculture and industry. It produces goods which have little relation with what the country most needs, but puts large sums in the public purse. In agriculture priority sometimes goes to immense plantations financed by national or foreign capital, because they give the country a share of world trade, and sometimes to co-operatives, whether old-style or modern, producing food crops which provide the country with an adequate supply of good quality food.

This paper is not concerned with such questions. They are serious economic matters and each country deals with them as its history and future prospects suggest. But - and this is important - to a great extent they determine the conditions in which the people of the country

live and work. It might be added that discussion of how the economy and society should develop does not go on only in so-called developing countries. The most highly developed countries now steer widely diverging courses, and sometimes change their direction.

This paper is on a more technical and more limited subject than economics, but cannot completely escape their influence; for a man's ideas on mankind and society may mould his technical opinions.

Observers are gradually coming to agree that to be completely successful a technical set-up and its attendant organisation (the "hardware" and "software" of industrialisation) require managerial staff, workers and their families to conform in mentality and behaviour to the original model. Industrialisation, technology and working organisation are not neutral. Those whom they touch they transform in ways explicitly or implicitly corresponding to the views of their originators. If transformation is incomplete technique and organisation do not achieve the production expected of them, either quantitatively or qualitatively. Economically speaking, this is a pity; but it may be the sign of a healthy reaction by society to the ruthless constraints being forced upon it.

If transformation is complete production will be excellent. It may even exceed that of the country from which the new technique and organisation came. But society as it was will be broken beyond recall, and all the evils of the industrial system - psychopathology, delinquency, industrial poisoning, pollution, and so on - will appear.

The above general remarks could be included in a training programme. Bearing them in mind, the first part of this paper will examine the scope of knowledge necessary to make a choice of technology and working conditions. The second part will consider/what the various social groups have to learn to act in constructive fashion.

2.0 THE SCOPE OF KNOWLEDGE

The idea that choice is possible between one technology and another or that a machine can be altered to improve working conditions is fairly new. It is the exact opposite of the "one best way" idea which was one of the mainsprings of the second industrial revolution and is still widely advocated by sellers of technology, the more so if they represent a trust that is particularly powerful in one or more regions of the world. The fact is that almost any result is obtainable by a wide variety of techniques, but obviously the cost-benefit relation is not the same for all techniques or in all countries. Economics should decide what choice is made; and it is usual before making any investment, large or small, to present the "decision-makers" with an imposing economic report.

Unfortunately some reports are unsound because they are based on features that differ too much from those prevalent in the purchasing country and make too limited an assessment of effects.

These features may be geographical ones, such as climate and communications; social ones, such as the quantity and quality of skilled labour and managerial staff available; or commercial ones, such as the size and stability of the local or regional market.

Assessment of effects on workers and their families may be too limited because of large-scale migrations which empty the countryside and fill shanty towns; on the environment, because of pollution of the atmosphere and water and resulting loss of essential agricultural resources; or on social and political developments, because of destruction of the previous social system, the creation of "the submerged tenth", and delinquency).

Any changes in economic and social life should be considered by reference to at least three criteria - the nation, the enterprise and the family. Occupational disease, employment injury, bigger wages,

a better food situation, and higher standards of proficiency cost or benefit the nation, the enterprise and the family very differently, according to what fiscal and social system is in force.

Regrettably, standard works of reference on socio-technics (adapting technology to the public at large) or ergonomics (adapting work to the worker) are usually negative in tone. They stress the harmful effects and social costs of technical change. This approach, when it is systematic, is deplorable; in most of South-East Asia the current/growth rate is only three per cent. This has to be increased. The necessary annual growth rate is five, six, seven per cent or more. Only bold technical innovation in industry and agriculture will make it possible. The only conceivable course, therefore, is to help on this technical change by presenting established data on those branches of science concerned with human performance in language which leaders of industry and engineers can use to promote social and economic progress.

The scope of knowledge needed for choice of technology and to create good working conditions may be broadly divided into two parts; first, choice of technology and adapting it to the community, and secondly, choice of the worker and adapting the work to him.

2.1 Socio-technics : choice of technology and adapting it to the community.

Many branches of science - geography and demography, anthropology and ethnology, sociology and economics - can be of use for this practical purpose.

2.1.1. Geography and demography. Obviously, knowledge of local geology and topography, of the natural drainage system, rainfall and climate are as essential to set up an immense sugar plantation and refinery in the North of the Ivory Coast as for a new lorry factory in the Euphrates Valley in Iraq. Equally, knowledge of human (and even historical) geography, and

of population trends, is necessary in either case.

It is not enough to know that the Ferkessedogou region is fertile and watered by a river (the Bandama) having a constant volume of water. Another essential element is that the neighbouring Korhogo area is thickly populated - by no means a usual state of affairs in this region, which has been very sparsely populated since the devastating wars of the 18th and 19th centuries. It is also relevant that the inhabitants of the Korhogo area spend part of the year cultivating food crops and are available for other work just when they would be needed, i.e., at the season for sugar-cane cutting (source : M. Coulibaly, Director of the Institut de Géographie Tropicale of the University of Abidjan). These geographical data also show that manpower is only relatively plentiful, and will have to be imported in great numbers from abroad unless, as in Australia or the South of the United States of America, it is decided to invest in sugar-cane cutting machines which do the work of 80 men. It is immediately obvious that in sugar-cane growing regions where underemployment is endemic and permanent (as in the States of Sao Paulo, Brazil, or Negros Occidental, Philippines) human geography provides arguments against the introduction of cane-cutting machines. Moreover, reference to climatic and agricultural geography shows that the cutting season is much longer in Brazil and the Philippines than in the Ivory Coast, so that manpower can be employed there all, or nearly all, the year round.

2.1.2. Anthropology and Ethnology. The usual practice in industrial countries would find sociological data sufficient for the study of life in a community. It may therefore seem curious to suggest including anthropological and ethnological matter in a socio-technics training programme.

But the fact is that in approaching sociological questions only from a sociological angle, using only sociological methods and theories, there

is no small risk of confusing phenomena of very different origins whose dynamics have therefore nothing in common. It would be foolhardy to compare the ten million population of Mexico City and suburbs with the ten million population of Greater Paris, or unemployment in Abidjan, London and New York, without observing due precautions.

Drastic as are the effects of the industrial system on ethnic and sociological structures, France, an old, industrial, centralised country, shows the political, economic and social penalties of too strictly unifying the development of the various parts of the country. In countries where people of different ethnic origins exist side by side, where there are even different peoples each with its own history, degree of technical development, and system of values, it is all the more dangerous to disregard such differences. This is true even if the government is attempting to bring about something as near as can be to national union. The valuable work of the Department of Anthropology of the University of the Philippines (Mr. P. Jocano), and the Institute of Ethnology and Anthropology of the University of Mexico, may be quoted in this connection. It is noteworthy that their research is not into the past, but uses linguistic analysis and description of the evolution of the family as an institution, of methods of production and ways of life, to study the gradual change of the old social system into the new society.

Some data are of immediate practical use. If, as often happens nowadays, it is proposed to build a factory in a Mahomedan country in a sub-tropical desert region to produce a given volume of goods yearly, it is essential to know how strictly the fast of Ramadan is kept. Where workers observe it to the letter, going without food and even water from sunrise to sunset, it is quite clear that in years when the fast falls

during the hot season production will fall sharply, particularly in hot workshops without air conditioning or where strenuous physical exertion is needed. Daily production capacity will therefore have to be increased. But there are ways of alleviating this situation. For example, in a number of Muslim countries some maintenance work is done mainly by non-Muslim nationals of the country, and a thorough review and servicing of equipment can be made to coincide with Ramadan. But such arrangements have the serious disadvantage of emphasising the rift between the industrial employment of two religious communities in a single country. There are, obviously, very close connections between anthropological data and the industrial set-up.

2.1.3 Sociology. It has become a commonplace to point out the connection between social change and industrialisation in a single country. In particular, study of the harmful effects of industrialisation on social life has so far progressed that the serious economic arguments for expanding the secondary sector are sometimes forgotten. Any teaching programme must therefore fully consider all the repercussions of industrialisation. This critical study is most useful where it is differential and illuminates the background of successful operations as well as unsuccessful ones : and the socio-technical and ergonomic approaches have in common that they are more interested in arriving at a constructive solution than in criticising a bad one.

To achieve anything useful scientific research must be of sufficient scope to appreciate how complex and contradictory is social change. For example, the distribution of tasks between men and women has been radically changed in Bali by harvesting rice not twice a year as in the past, but

three times, substituting a rice with a shorter stalk which has to undergo numerous processes (source : Professor Manuaba of Denpasar).

To take other examples, improved marketing of palm-tree fruit, the general increase in longevity, and the volume of emigration from neighbouring countries have led small landowners in the Ivory Coast who formerly ran their farms with the help of their sons to take on paid workers from Mali or the Upper Volta, and to switch from the social pattern of the village community to the wage system and private property. (Ivory Coast - source : Mr. Drevet-Sepes).

Socio-technics is mainly the study of the close relation between the means of production and the kind of social life which results. Thus the method of producing popular electronic apparatus such as radio and TV sets and cassette recorders makes necessary a complex social pattern which has to be built up from the beginning where it does not already exist, so that workers shall have the technical abilities required of them.

The socio-technical pattern thus obtained leads to the same psychopathological disturbances in Calcutta, Manila and Mexico City as in Paris, New York or Budapest. But in countries in course of industrial development the situation is aggravated because employed workers as a whole become a "race apart" of socially privileged beings - who suffer from psychological disturbances hitherto unknown in that part of the world.

Another aspect of relations between technology and society is the study of local sociological causes of the failure of an industrial undertaking. All over the world factories acquired at great cost by developing countries have closed down or are working below ~~their~~ capacity. A frequent cause of these bitter failures is the gross disproportion between manpower resources and technical equipment.

For example, an automated factory in a small town in a developing Latin-American country has closed down because the few automation technicians born in that country easily find work in large towns, where demand is great and life is considered to be pleasanter. The services of foreign technicians are prohibitively expensive because international salaries are high and exchange rates low.

In old industrial countries and towns a more subtle form of failure is frequent. A factory opens in an area of underemployment. It has jobs for a large number of workers. A few years later local underemployment is as bad as ever; the factory employs only foreigners, because only foreigners will accept the working conditions in it (e.g., the Southern Alsace region of France and SODEPALM in the Ivory Coast).

2.2.0 Ergonomy.

As has been shown above, the various branches of science dealing with human behaviour have undoubtedly influenced choice of technology conducive to better working conditions. But this part of socio-technics is still in its infancy and much work has still to be done on framing its basic ideas. This is not true of knowledge on the subject of adapting work to the worker. Ergonomic thought over the last 25 years has led to this being better understood and it is widely used throughout the world to improve working conditions.

This does not mean that all problems have been solved, least of all by countries in course of industrialisation. In fact research has been almost exclusively in temperate and cold countries on inhabitants who biologically speaking are in a very special position, and on a particular kind of technology. Research anywhere has been predominantly on cosmonautics and military aviation, and to a lesser extent on supervision of

the control panels of large automated plants in the electrical, petroleum, chemical and similar industries. There has been relatively little research into working conditions in mass production in industry and services, and very little indeed on what goes on in non-industrial agriculture and handicrafts.

In the special conditions of developing industrial countries the scope of knowledge needed to use ergonomics will by no means be that laid down in foreign books. Many treatises or précis on ergonomics are only partly applicable to such conditions. Re-definition of the scope of knowledge necessary can only be done by researchers from the developing industrial countries concerned. The following strikingly illustrates this : an international organisation asked a researcher from an Atlantic country to prepare a book on an important branch of ergonomics for world use. The book is in many ways excellent; but the subject leads to recommendations based essentially on anthropometry, and the author is at pains to point out that the data he quotes is not complete and applies essentially to 'Western Caucasians' (sic). There is, according to him, very little anthropometric data available on Asians other than Japanese; this in spite of the anthropometric research of Professor R.N. Senn in Calcutta, Professor A. Manuaba in Denpasar, Dr. Thu in Hanoi, the Child and Youth Research Center in Manila, and many others ... Its results have all been, or will be, published in scientific magazines or other publications, and are surely "available data".

Bearing in mind the above remarks, which anyone may expand as he pleases, the various branches of ergonomics should be taught with emphasis on description of the ^{actual} working population, exact analysis of work and working conditions, and a factual inventory of all aspects of the daily workload.

2.2.1 The Working Population.

This description may be infinitely subdivided but must always be related to the actual working population. Significant examples of the economically active population must be investigated, and differences between its various parts recorded - differences between workers in the primary, secondary and tertiary sectors, and differences in sex and age. All such distinctions are necessary for correct assessment of ability, as regards anthropometry no less than physical strength or keenness of vision. Thus the Institut National d'Hygiène et d'Epidémiologie in Hanoi has shown that the male Vietnamese worker is 1.58 metres (\pm 4 cm.) tall and the female Vietnamese worker is 1.495 metres (\pm 3 cm.) tall; but that in spite of their small stature the men's muscular strength is comparable with that of taller European workers. In terms of pressure exerted by the right hand it is 30-37 Kg. for men, and 19-25 Kg. for women. The authors note that the women's muscular strength falls much more than the men's, which is at its height at age 27 or thereabouts. These data have been of the very greatest importance in programming work in a bicycle factory recently built in Viet Nam by a French group.

Another important aspect of the ability of the working population is its state of health and nutrition. All too often parasites and chronic infections reduce their ability to work. With regard to their nutrition, their undernourishment may be quantitative because they do not earn enough to provide sufficient calories for themselves and their families; or qualitative, either because they earn too little or because the way they buy and prepare their food is contrary to their feeding habits.

When accumulating knowledge of the working population full attention should be paid to its standard of education (its literacy, vocational training and secondary or university education) and practical training.

There should be due recognition of the considerable abilities of workers trained in the old-fashioned way, who are expert in definite complex handicraft techniques and ~~are~~ ^{thus} easily adaptable to industrial processes with which they are unfamiliar.

2.2.2 Work Analysis.

Workload is very generally assessed with too strict reference to standards, and incompletely. As a result the actual position is seriously underestimated.

For example, a woodcutter's workload may be assessed in experimental conditions or good working conditions over a relatively short time, from observation of a young healthy experienced worker. In fact, as was shown in the previous section, differences in age, health and experience lead to great differences in workers' ability and determine different relative workloads. Also, the effort entailed by this kind of work varies enormously according to the quality of machines and tools and how well they are maintained. E. Grandjean of Zurich has shown that merely the pattern of teeth on a saw may make as much as 20 per cent difference to the effort expended. A point often underestimated is the duration of effort. Work of limited duration done under the research worker's and the timekeeper's supervision is very different from that done over a period of days, weeks or months.

Research by A. Laville has shown the great variations in the workload which are produced by the innumerable incidents occurring in what is seemingly completely monotonous work.

2.2.3 Making an Inventory of the Daily Workload.

Workload is not limited to paid working time. Difficult communications and travelling time have also to be considered. A two-hour journey is not

uncommon in large towns, and much longer journeys have to be made daily in immense quickly growing cities like Bangkok, Mexico City and Rio de Janeiro.

Another aspect of the workload concerns other work which for social or economic reasons has to be done by a single person. The author has shown elsewhere that women working in the French electronics industry spend something like $12 \frac{1}{2}$ hours daily on paid employment, travelling, and domestic work. This pattern comes up time and again all over the world when the working woman's timetable is examined.

Professor A. Manuaba of Denpasar points out the very important fact that a man may be a peasant between 4 a.m. and 10 a.m., an artisan between noon and 4 p.m., and a musician or waiter from 6 p.m. to 9 p.m.! A worker doing several ill-paid jobs infinitely complicates assessment and reduction of the workload.

The analysis required is complex in the extreme; but there is no getting away from it. There is no other means of finding out the truth and producing a strategy to improve working conditions which will be effective, humanly speaking, as well as economically acceptable.

2.2.4 Branches of Knowledge making a Contribution to Ergonomy.

The examples described above show that ergonomy is an integrated approach in which anthropometry, physiology, experimental psychology, hygiene and the study of pollution, together with technology and work organisation, help to describe and improve working conditions. It has also a powerful tool of its own, namely its methodology for analysing, introducing and validating working situations and changes therein.

3.0 IMPROVEMENT OF WORKING CONDITIONS : THE INFLUENCE AND TRAINING OF CERTAIN SOCIAL GROUPS.

As has been seen above, the excellence or otherwise, of working conditions is intimately bound up with many features of social life. All social groups should be conscious of their influence on working life, and mass media campaigns can be very effective in an all-out drive to make them so.

But this paper will be mainly concerned with the groups which directly affect working conditions; with the decision-makers (managers), engineers, specialists in labour problems, socio-technicians, ergonomists and with the workers themselves, whose influence is decisive but different. It will discuss what it seems necessary for each group to know, and the training methods applicable.

3.1 Necessary Knowledge for the Social Groups mentioned.

3.1.1 Decision-makers (managers).

Groups decisively influencing working conditions include financiers, planners, employers, trade unionists and senior administrative officials of the Ministry of Labour and Social Security.

3.1.1.1 Financiers.

Financiers decisively influence working conditions; by being generous or otherwise in providing social welfare, medical services or accident prevention, and by the way they assess the advantages and disadvantages of various types of technology and work organisation, such as assembly lines and alternating shifts. Their choice varies enormously according as the financial equilibrium considered is that of the enterprise or the nation as a whole and whether social compensations, (such as

health or housing programmes, action to reduce delinquency, and so forth) are considered, rather than the cost and advantages to the individual. Thus the cost of a worker suffering from silicosis is not the same for the enterprise, which may pay out very little, the social security system, which may pay a high pension, a low one, or none at all, and the sufferer and his family, who pay a high price in cash and suffering alike. Or depending on the method of assessment, the economic choice of method of cleaning cast metal in a foundry would be either sanding and shot-blasting.

3.1.1.2 Planners.

Planners do not always realise the importance of working conditions. The influence of bad working conditions on employment has been shown in Western Europe, where arduous work is done by foreign workers less particular about their working conditions whilst large numbers of unemployed nationals have to be given a bare living. To some extent the situation is similar in the Ivory Coast.

Planning also decides the broad choice between technologies entailing widely differing working conditions, for example, the degree to which agriculture is mechanised or industry automated.

3.1.1.3 Top Management.

Leaders of large enterprises, and of their trade union organisations, have to be fully aware of how important working conditions are to workers, who are not interested solely in what they earn even if they are very poor. And they have to realise that bad working conditions are extremely expensive : employment injuries are caused in much the same way as breakdowns in which material damage may be very great although workers escape injury. The cost of damage done to plant and equipment by such breakdowns is high.

Similarly, bad working conditions make for unreliable products of a quality too poor for the international market.

Thus, when investing in plant and financing its maintenance top management has to have in mind not only social difficulties but also the economic problems connected with bad working conditions.

3.1.1.4 Trade Unionists.

It seems obvious that the proper study of trade union leaders is working conditions. But it is often clear that workers think other social problems - employment, wages, pensions and social welfare - are the most important. Trade union leaders, in developing and developed industrial countries alike, have to make an effort to convince themselves as well as the workers that working conditions are inseparable from employment, wages and social welfare. There is no advantage in having a job, a wage, and a pension if accidents are many, sickness comes often, and a short working life ends in exhaustion.

3.1.1.5 Senior Labour and Social Security Administrators.

Officials responsible for drawing up and enforcing labour legislation and regulations are in the highest degree concerned with working conditions. But labour administrations all over the world have been known to make admirable regulations which for technical or economic reasons are impossible, or next to impossible, to apply. When temperatures soar in a factory in a tropical country with enormous glass walls facing South-West and a host of machines each with its heat engine, there is little to be done except knock the factory down and buy other machinery, or condition 20,000 or even 100,000 cubic metres of air.

The powers of labour administration must, then, be more concerned with technicalities, and its responsibilities limited to that stage of

the project at which the factory has not been built and machinery has still to be ordered. And senior labour administrators must not be trained purely and simply to make and enforce regulations.

The special teaching curriculum for all kinds of decision-makers is first and foremost socio-technical; the underlying principles of ergonomomy are not explained to them in detail. First requisites are good statistics on employment injuries, breakdowns, occupational diseases, and labour turnover, and reliable financial assessments of the cost of bad working conditions, taking into account their incidence on production and the economy in general.

3.1.2 Engineers and Technicians.

Clearly, engineers and technicians are the people who create the technical set-up. The ergonomic knowledge essential to them is part and parcel of their technical training, and they have positively no choice but to acquire it.

As recommended by various international bodies years ago, engineers and technicians have necessarily to be given thorough ergonomic training from their schooldays onwards and also recurrent training on special problems which work done by man raises in their particular sector.

3.1.2 } Specialised Groups.

Some persons on the staff of an enterprise, such as doctors, psychologists, and safety and organisation engineers, do work specifically covering human relations with the production set-up. They have to be not only competent in ergonomomy but also potential instructors. They must accordingly have much more teaching.

3.1.3.1 Factory Doctors.

In many countries factory doctors do nothing but therapy, whereas

much of their work should be to assess the abilities of the working population and the epidemiology of the harmful effects of working conditions, to describe unfavourable working situations and make recommendations for their improvement. There are many examples of excellent training using this approach in South-East Asia (in India, Indonesia, Japan, Philippines, Singapore and elsewhere).

3.1.3.2 Labour Psychologists.

All too often, labour psychologists still work on staff selection or the psycho-sociology of disputes, whereas they should take the lion's share in investigating the causes of employment injuries and in work analysis in general. They are the people who can put their finger on the hidden difficulties in a technical set-up which lead to adverse behaviour, and they should bear much of the burden of ergonomic training.

3.1.3.3 Safety Engineers.

Safety engineers must take a decisive part in improving working conditions, especially as in many enterprises the tendency is to form a single "Safety and Working Conditions" department. Generally accepted views on safety must accordingly be widened, and orthodox activities such as applying regulations, using individual protectors, and safety posters or competitions be supplemented by vigorous use of ergonomic data and system analysis on the lines, for example, followed by the Total Loss Centre Training of the University of Hawai.

3.1.3.4 Organisation Engineers.

The present strong opposition to Taylorism in the industrial world is to a great extent legitimate; systematic Taylorism is by no means of value everywhere, and it is not the best system in much of modern industry.

But work still has to be properly organised. Ergonomy brings organisation

a very considerable volume of new, useful data which engineers have to assimilate so that useless workload can be cut down and confidence in the technical set-up increased.

3.1.3.5 Other Specialist Engineers.

It may be a surprise to find purchasing department engineers or new operations engineers on the list of specialised groups.

The fact is that officials buying machinery for their employers must be familiar with the standards relating to working conditions which it has to meet. Machines not up to ILO or ISO standards and unsaleable in some industrial countries must not be sold to enterprises in developing industrial countries.

New operations engineers are responsible for the removals and rearrangements so frequent in a factory. Each of these operations gives them a chance to improve working conditions which have long caused grumbling on the shop floor. They cannot do this if they are incompetent.

3.1.4 Socio-technicians and Ergonomists.

Every country and enterprise or group of enterprises needs high quality socio-technicians and ergonomists to give consultations and train other social groups.

It is ^{not} necessary to dwell on this general need, but every national background must be carefully studied so that the spirit and scope of these two specialities provide exactly what the country or enterprise requires, and models good in other circumstances are not incautiously adopted.

Evidently, to train such specialists calls for a great effort comprising two or three years of post-graduate training.

3.1.5 The Workers.

The workers' function in labour conditions is an immense subject, as yet relatively unexplored anywhere. This training should give workers a better understanding of their work and the dangers it entails, improve their behaviour and encourage them to propose improvements.

3.2 Training Methods.

Methods of training in working conditions are innumerable, if only in duration. This varies from the few hours of a seminar for decision-makers to several years for socio-technicians and ergonomists.

Differences do not end there. Much of the training has, of course, to be done at school as part of general training; this applies equally to metalworkers in their apprenticeship school and to the curriculum of would-be doctors, psychologists and engineers. Still more has to be done by recurrent training : existing staff has to be quickly trained; knowledge is soon out of date; and no one can go through life without adding to what he learned in his far-off schooldays.

Some training will be highly specialised; seminars will be held on working conditions in sugar growing-cum-refining estates or spinning mills, and specialists of various kinds - such as engineers, doctors, psychologists and labour inspectors - will be invited.

Some training will be in particular occupations, and ergonomic data can be submitted to factory doctors and research engineers.

For high-level specialists, or very restricted subjects such as working conditions in the merchant marine and data processing, international meetings are preferable. For South-East Asia it is certainly very desirable to hold numerous Asian meetings, particularly if they can get help from neighbouring countries such as India and Japan.

Teaching must be written as well as oral. There should preferably be a collection of books on socio-technics and ergonomics, and a scientific magazine on those subjects, for South-East Asia alone.

Brochures and popular newspapers might be very useful for mass dissemination.

4.0 CONCLUSIONS.

Working conditions are the result of extremely complex technical, economic and social phenomena associated with national geography, demography and anthropology.

One of the achievements of modern science is that it has better understood the relations between the various aspects of the situation and has suggested alternatives to apparently inadequate solutions.

The scope and complexity of the problems call for the services of large numbers of experts and informed action by many social groups.

To improve existing conditions, and particularly to build good working conditions up from the beginning in new production centres, there must be ample facilities for information and training.

The social consequences of such efforts are fewer employment injuries and less occupational disease, fatigue, absenteeism and labour turnover. Their economic consequences are less financial loss through breakdowns, better quality goods and a steadier flow of production; greater reliability of complex computerised and automated plant; and better use of material and spare parts, leading to fewer imports.

The ILO can play a very important part in this work, particularly if it can draw up regional training plans for South-East Asia.

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Information and Training Needs for Choice
of Technology and Working Conditions

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1.0 INTRODUCTION

Working and living conditions depend on numerous decisions taken in every country by all kinds of authorities for a wide variety of reasons. On the conditions thus determined the country's immediate future will be built; they are the foundation of its economic and social progress.

Twenty years ago it was generally accepted that all countries of the world could easily be classified according to the single criterion of per capita revenue. This was taken to be the essential - perhaps the only - gauge of economic and social success. Thus the most industrialised countries were taken as a standard of comparison for all the others.

But Gross Domestic Product (G.D.P.) and its offshoot per capita G.D.P. are only an index of commercial activity - an imperfect index even in an industrialised country, ignoring as it does the economic activities of mothers and (largely) of old-style farmers. It becomes grossly inaccurate in countries not yet fully industrialised, where non-commercial economic activities linked to the traditional system are still by far the most common. Describing economic developments in terms of per capita G.D.P. thus tends to ascribe too much importance to greater commercial production and hide any fall that may take place in non-commercial production at family or village level; it tends, that is, to highlight the advantages

of industrialisation to the national economy but not the harm it does to the life of the individual.

As industrialisation spreads throughout the world it becomes clear that assessing its effects is an extremely complex matter. Some countries have reached a very high G.D.P., but signs of social dissatisfaction in them increase and multiply as old production systems break down or new ones turn out to be less perfect than they looked at first. In other countries economic growth benefits only a minority - the middle classes, or more generally speaking, town dwellers. All too often the peasants - who are still three-quarters of the population of the world - lead a no less miserable existence than before, or are still further impoverished.

The very way in which industrialisation takes place is often questioned. Some countries give priority to heavy industry; in the long run it leads to economic independence, but often at the price of crushing indebtedness which in the short run keeps down the levels of living of most of the urban and peasant population. Other countries welcome foreign investment in their agriculture and industry. It produces goods which have little relation with what the country most needs, but puts large sums in the public purse. In agriculture priority sometimes goes to immense plantations financed by national or foreign capital, because they give the country a share of world trade, and sometimes to co-operatives, whether old-style or modern, producing food crops which provide the country with an adequate supply of good quality food.

This paper is not concerned with such questions. They are serious economic matters and each country deals with them as its history and future prospects suggest. But - and this is important - to a great extent they determine the conditions in which the people of the country

live and work. It might be added that discussion of how the economy and society should develop does not go on only in so-called developing countries. The most highly developed countries now steer widely diverging courses, and sometimes change their direction.

This paper is on a more technical and more limited subject than economics, but cannot completely escape their influence; for a man's ideas on mankind and society may mould his technical opinions.

Observers are gradually coming to agree that to be completely successful a technical set-up and its attendant organisation (the "hardware" and "software" of industrialisation) require managerial staff, workers and their families to conform in mentality and behaviour to the original model. Industrialisation, technology and working organisation are not neutral. Those whom they touch they transform in ways explicitly or implicitly corresponding to the views of their originators. If transformation is incomplete technique and organisation do not achieve the production expected of them, either quantitatively or qualitatively. Economically speaking, this is a pity; but it may be the sign of a healthy reaction by society to the ruthless constraints being forced upon it.

If transformation is complete production will be excellent. It may even exceed that of the country from which the new technique and organisation came. But society as it was will be broken beyond recall, and all the evils of the industrial system - psychopathology, delinquency, industrial poisoning, pollution, and so on - will appear.

The above general remarks could be included in a training programme. Bearing them in mind, the first part of this paper will examine the scope of knowledge necessary to make a choice of technology and working conditions. The second part will consider/^{what} the various social groups have to learn to act in constructive fashion.

2.0 THE SCOPE OF KNOWLEDGE

The idea that choice is possible between one technology and another or that a machine can be altered to improve working conditions is fairly new. It is the exact opposite of the "one best way" idea which was one of the mainsprings of the second industrial revolution and is still widely advocated by sellers of technology, the more so if they represent a trust that is particularly powerful in one or more regions of the world. The fact is that almost any result is obtainable by a wide variety of techniques, but obviously the cost-benefit relation is not the same for all techniques or in all countries. Economics should decide what choice is made; and it is usual before making any investment, large or small, to present the "decision-makers" with an imposing economic report.

Unfortunately some reports are unsound because they are based on features that differ too much from those prevalent in the purchasing country and make too limited an assessment of effects.

These features may be geographical ones, such as climate and communications; social ones, such as the quantity and quality of skilled labour and managerial staff available; or commercial ones, such as the size and stability of the local or regional market.

Assessment of effects on workers and their families may be too limited because of large-scale migrations which empty the countryside and fill shanty towns; on the environment, because of pollution of the atmosphere and water and resulting loss of essential agricultural resources; or on social and political developments, because of destruction of the previous social system, the creation of "the submerged tenth", and delinquency).

Any changes in economic and social life should be considered by reference to at least three criteria - the nation, the enterprise and the family. Occupational disease, employment injury, bigger wages,

a better food situation, and higher standards of proficiency cost or benefit the nation, the enterprise and the family very differently, according to what fiscal and social system is in force.

Regrettably, standard works of reference on socio-technics (adapting technology to the public at large) or ergonomics (adapting work to the worker) are usually negative in tone. They stress the harmful effects and social costs of technical change. This approach, when it is systematic, is deplorable; in most of South-East Asia the current/growth rate is only three per cent. This has to be increased. The necessary annual growth rate is five, six, seven per cent or more. Only bold technical innovation in industry and agriculture will make it possible. The only conceivable course, therefore, is to help on this technical change by presenting established data on those branches of science concerned with human performance in language which leaders of industry and engineers can use to promote social and economic progress.

The scope of knowledge needed for choice of technology and to create good working conditions may be broadly divided into two parts; first, choice of technology and adapting it to the community, and secondly, choice of the worker and adapting the work to him.

2.1 Socio-technics : choice of technology and adapting it to the community.

Many branches of science - geography and demography, anthropology and ethnology, sociology and economics - can be of use for this practical purpose.

2.1.1. Geography and demography. Obviously, knowledge of local geology and topography, of the natural drainage system, rainfall and climate are as essential to set up an immense sugar plantation and refinery in the North of the Ivory Coast as for a new lorry factory in the Euphrates Valley in Iraq. Equally, knowledge of human (and even historical) geography, and

of population trends, is necessary in either case.

It is not enough to know that the Ferkessedogou region is fertile and watered by a river (the Bandama) having a constant volume of water. Another essential element is that the neighbouring Korhogo area is thickly populated - by no means a usual state of affairs in this region, which has been very sparsely populated since the devastating wars of the 18th and 19th centuries. It is also relevant that the inhabitants of the Korhogo area spend part of the year cultivating food crops and are available for other work just when they would be needed, i.e., at the season for sugar-cane cutting (source : M. Coulibaly, Director of the Institut de Géographie Tropicale of the University of Abidjan). These geographical data also show that manpower is only relatively plentiful, and will have to be imported in great numbers from abroad unless, as in Australia or the South of the United States of America, it is decided to invest in sugar-cane cutting machines which do the work of 80 men. It is immediately obvious that in sugar-cane growing regions where underemployment is endemic and permanent (as in the States of Sao Paulo, Brazil, or Negros Occidental, Philippines) human geography provides arguments against the introduction of cane-cutting machines. Moreover, reference to climatic and agricultural geography shows that the cutting season is much longer in Brazil and the Philippines than in the Ivory Coast, so that manpower can be employed there all, or nearly all, the year round.

2.1.2. Anthropology and Ethnology. The usual practice in industrial countries would find sociological data sufficient for the study of life in a community. It may therefore seem curious to suggest including anthropological and ethnological matter in a socio-technics training programme.

But the fact is that in approaching sociological questions only from a sociological angle, using only sociological methods and theories, there

is no small risk of confusing phenomena of very different origins whose dynamics have therefore nothing in common. It would be foolhardy to compare the ten million population of Mexico City and suburbs with the ten million population of Greater Paris, or unemployment in Abidjan, London and New York, without observing due precautions.

Drastic as are the effects of the industrial system on ethnic and sociological structures, France, an old, industrial, centralised country, shows the political, economic and social penalties of too strictly unifying the development of the various parts of the country. In countries where people of different ethnic origins exist side by side, where there are even different peoples each with its own history, degree of technical development, and system of values, it is all the more dangerous to disregard such differences. This is true even if the government is attempting to bring about something as near as can be to national union. The valuable work of the Department of Anthropology of the University of the Philippines (Mr. P. Jocano), and the Institute of Ethnology and Anthropology of the University of Mexico, may be quoted in this connection. It is noteworthy that their research is not into the past, but uses linguistic analysis and description of the evolution of the family as an institution, of methods of production and ways of life, to study the gradual change of the old social system into the new society.

Some data are of immediate practical use. If, as often happens nowadays, it is proposed to build a factory in a Mahomedan country in a sub-tropical desert region to produce a given volume of goods yearly, it is essential to know how strictly the fast of Ramadan is kept. Where workers observe it to the letter, going without food and even water from sunrise to sunset, it is quite clear that in years when the fast falls

during the hot season production will fall sharply, particularly in hot workshops without air conditioning or where strenuous physical exertion is needed. Daily production capacity will therefore have to be increased. But there are ways of alleviating this situation. For example, in a number of Muslim countries some maintenance work is done mainly by non-Muslim nationals of the country, and a thorough review and servicing of equipment can be made to coincide with Ramadan. But such arrangements have the serious disadvantage of emphasising the rift between the industrial employment of two religious communities in a single country. There are, obviously, very close connections between anthropological data and the industrial set-up.

2.1.3 Sociology. It has become a commonplace to point out the connection between social change and industrialisation in a single country. In particular, study of the harmful effects of industrialisation on social life has so far progressed that the serious economic arguments for expanding the secondary sector are sometimes forgotten. Any teaching programme must therefore fully consider all the repercussions of industrialisation. This critical study is most useful where it is differential and illuminates the background of successful operations as well as unsuccessful ones : and the socio-technical and ergonomic approaches have in common that they are more interested in arriving at a constructive solution than in criticising a bad one.

To achieve anything useful scientific research must be of sufficient scope to appreciate how complex and contradictory is social change. For example, the distribution of tasks between men and women has been radically changed in Bali by harvesting rice not twice a year as in the past, but

three times, substituting a rice with a shorter stalk which has to undergo numerous processes (source : Professor Manuaba of Denpasar).

To take other examples, improved marketing of palm-tree fruit, the general increase in longevity, and the volume of emigration from neighbouring countries have led small landowners in the Ivory Coast who formerly ran their farms with the help of their sons to take on paid workers from Mali or the Upper Volta, and to switch from the social pattern of the village community to the wage system and private property. (Ivory Coast - source : Mr. Drevet-Sepes).

Socio-technics is mainly the study of the close relation between the means of production and the kind of social life which results. Thus the method of producing popular electronic apparatus such as radio and TV sets and cassette recorders makes necessary a complex social pattern which has to be built up from the beginning where it does not already exist, so that workers shall have the technical abilities required of them.

The socio-technical pattern thus obtained leads to the same psychopathological disturbances in Calcutta, Manila and Mexico City as in Paris, New York or Budapest. But in countries in course of industrial development the situation is aggravated because employed workers as a whole become a "race apart" of socially privileged beings - who suffer from psychological disturbances hitherto unknown in that part of the world.

Another aspect of relations between technology and society is the study of local sociological causes of the failure of an industrial undertaking. All over the world factories acquired at great cost by developing countries have closed down or are working below ~~their~~ capacity. A frequent cause of these bitter failures is the gross disproportion between manpower resources and technical equipment.

For example, an automated factory in a small town in a developing Latin-American country has closed down because the few automation technicians born in that country easily find work in large towns, where demand is great and life is considered to be pleasanter. The services of foreign technicians are prohibitively expensive because international salaries are high and exchange rates low.

In old industrial countries and towns a more subtle form of failure is frequent. A factory opens in an area of underemployment. It has jobs for a large number of workers. A few years later local underemployment is as bad as ever; the factory employs only foreigners, because only foreigners will accept the working conditions in it (e.g., the Southern Alsace region of France and SODEPALM in the Ivory Coast).

2.2.0 Ergonomy.

As has been shown above, the various branches of science dealing with human behaviour have undoubtedly influenced choice of technology conducive to better working conditions. But this part of socio-technics is still in its infancy and much work has still to be done on framing its basic ideas. This is not true of knowledge on the subject of adapting work to the worker. Ergonomic thought over the last 25 years has led to this being better understood and it is widely used throughout the world to improve working conditions.

This does not mean that all problems have been solved, least of all by countries in course of industrialisation. In fact research has been almost exclusively in temperate and cold countries on inhabitants who biologically speaking are in a very special position, and on a particular kind of technology. Research anywhere has been predominantly on cosmonautics and military aviation, and to a lesser extent on supervision of

the control panels of large automated plants in the electrical, petroleum, chemical and similar industries. There has been relatively little research into working conditions in mass production in industry and services, and very little indeed on what goes on in non-industrial agriculture and handicrafts.

In the special conditions of developing industrial countries the scope of knowledge needed to use ergonomics will by no means be that laid down in foreign books. Many treatises or précis on ergonomics are only partly applicable to such conditions. Re-definition of the scope of knowledge necessary can only be done by researchers from the developing industrial countries concerned. The following strikingly illustrates this : an international organisation asked a researcher from an Atlantic country to prepare a book on an important branch of ergonomics for world use. The book is in many ways excellent; but the subject leads to recommendations based essentially on anthropometry, and the author is at pains to point out that the data he quotes is not complete and applies essentially to 'Western Caucasians' (sic). There is, according to him, very little anthropometric data available on Asians other than Japanese; this in spite of the anthropometric research of Professor R.N. Senn in Calcutta, Professor A. Manuaba in Denpasar, Dr. Thu in Hanoi, the Child and Youth Research Center in Manila, and many others ... Its results have all been, or will be, published in scientific magazines or other publications, and are surely "available data".

Bearing in mind the above remarks, which anyone may expand as he pleases, the various branches of ergonomics should be taught with emphasis on description of the ^{actual} working population, exact analysis of work and working conditions, and a factual inventory of all aspects of the daily workload.

2.2.1 The Working Population.

This description may be infinitely subdivided but must always be related to the actual working population. Significant examples of the economically active population must be investigated, and differences between its various parts recorded - differences between workers in the primary, secondary and tertiary sectors, and differences in sex and age. All such distinctions are necessary for correct assessment of ability, as regards anthropometry no less than physical strength or keenness of vision. Thus the Institut National d'Hygiène et d'Epidémiologie in Hanoi has shown that the male Vietnamese worker is 1.58 metres (\pm 4 cm.) tall and the female Vietnamese worker is 1.495 metres (\pm 3 cm.) tall; but that in spite of their small stature the men's muscular strength is comparable with that of taller European workers. In terms of pressure exerted by the right hand it is 30-37 Kg. for men, and 19-25 Kg. for women. The authors note that the women's muscular strength falls much more than the men's, which is at its height at age 27 or thereabouts. These data have been of the very greatest importance in programming work in a bicycle factory recently built in Viet Nam by a French group.

Another important aspect of the ability of the working population is its state of health and nutrition. All too often parasites and chronic infections reduce their ability to work. With regard to their nutrition, their undernourishment may be quantitative because they do not earn enough to provide sufficient calories for themselves and their families; or qualitative, either because they earn too little or because the way they buy and prepare their food is contrary to their feeding habits.

When accumulating knowledge of the working population full attention should be paid to its standard of education (its literacy, vocational training and secondary or university education) and practical training.

There should be due recognition of the considerable abilities of workers trained in the old-fashioned way, who are expert in definite complex handicraft techniques and ~~are~~ ^{thus} easily adaptable to industrial processes with which they are unfamiliar.

2.2.2 Work Analysis.

Workload is very generally assessed with too strict reference to standards, and incompletely. As a result the actual position is seriously underestimated.

For example, a woodcutter's workload may be assessed in experimental conditions or good working conditions over a relatively short time, from observation of a young healthy experienced worker. In fact, as was shown in the previous section, differences in age, health and experience lead to great differences in workers' ability and determine different relative workloads. Also, the effort entailed by this kind of work varies enormously according to the quality of machines and tools and how well they are maintained. E. Grandjean of Zurich has shown that merely the pattern of teeth on a saw may make as much as 20 per cent difference to the effort expended. A point often underestimated is the duration of effort. Work of limited duration done under the research worker's and the timekeeper's supervision is very different from that done over a period of days, weeks or months.

Research by A. Laville has shown the great variations in the workload which are produced by the innumerable incidents occurring in what is seemingly completely monotonous work.

2.2.3 Making an Inventory of the Daily Workload.

Workload is not limited to paid working time. Difficult communications and travelling time have also to be considered. A two-hour journey is not

uncommon in large towns, and much longer journeys have to be made daily in immense quickly growing cities like Bangkok, Mexico City and Rio de Janeiro.

Another aspect of the workload concerns other work which for social or economic reasons has to be done by a single person. The author has shown elsewhere that women working in the French electronics industry spend something like $12 \frac{1}{2}$ hours daily on paid employment, travelling, and domestic work. This pattern comes up time and again all over the world when the working woman's timetable is examined.

Professor A. Manuaba of Denpasar points out the very important fact that a man may be a peasant between 4 a.m. and 10 a.m., an artisan between noon and 4 p.m., and a musician or waiter from 6 p.m. to 9 p.m.! A worker doing several ill-paid jobs infinitely complicates assessment and reduction of the workload.

The analysis required is complex in the extreme; but there is no getting away from it. There is no other means of finding out the truth and producing a strategy to improve working conditions which will be effective, humanly speaking, as well as economically acceptable.

2.2.4 Branches of Knowledge making a Contribution to Ergonomy.

The examples described above show that ergonomy is an integrated approach in which anthropometry, physiology, experimental psychology, hygiene and the study of pollution, together with technology and work organisation, help to describe and improve working conditions. It has also a powerful tool of its own, namely its methodology for analysing, introducing and validating working situations and changes therein.

3.0 IMPROVEMENT OF WORKING CONDITIONS : THE INFLUENCE AND TRAINING OF CERTAIN SOCIAL GROUPS.

As has been seen above, the excellence or otherwise, of working conditions is intimately bound up with many features of social life. All social groups should be conscious of their influence on working life, and mass media campaigns can be very effective in an all-out drive to make them so.

But this paper will be mainly concerned with the groups which directly affect working conditions; with the decision-makers (managers), engineers, specialists in labour problems, socio-technicians, ergonomists and with the workers themselves, whose influence is decisive but different. It will discuss what it seems necessary for each group to know, and the training methods applicable.

3.1 Necessary Knowledge for the Social Groups mentioned.

3.1.1 Decision-makers (managers).

Groups decisively influencing working conditions include financiers, planners, employers, trade unionists and senior administrative officials of the Ministry of Labour and Social Security.

3.1.1.1 Financiers.

Financiers decisively influence working conditions; by being generous or otherwise in providing social welfare, medical services or accident prevention, and by the way they assess the advantages and disadvantages of various types of technology and work organisation, such as assembly lines and alternating shifts. Their choice varies enormously according as the financial equilibrium considered is that of the enterprise or the nation as a whole and whether social compensations, (such as

health or housing programmes, action to reduce delinquency, and so forth) are considered, rather than the cost and advantages to the individual. Thus the cost of a worker suffering from silicosis is not the same for the enterprise, which may pay out very little, the social security system, which may pay a high pension, a low one, or none at all, and the sufferer and his family, who pay a high price in cash and suffering alike. Or depending on the method of assessment, the economic choice of method of cleaning cast metal in a foundry would be either sanding and shot-blasting.

3.1.1.2 Planners.

Planners do not always realise the importance of working conditions. The influence of bad working conditions on employment has been shown in Western Europe, where arduous work is done by foreign workers less particular about their working conditions whilst large numbers of unemployed nationals have to be given a bare living. To some extent the situation is similar in the Ivory Coast.

Planning also decides the broad choice between technologies entailing widely differing working conditions, for example, the degree to which agriculture is mechanised or industry automated.

3.1.1.3 Top Management.

Leaders of large enterprises, and of their trade union organisations, have to be fully aware of how important working conditions are to workers, who are not interested solely in what they earn even if they are very poor. And they have to realise that bad working conditions are extremely expensive : employment injuries are caused in much the same way as breakdowns in which material damage may be very great although workers escape injury. The cost of damage done to plant and equipment by such breakdowns is high.

Similarly, bad working conditions make for unreliable products of a quality too poor for the international market.

Thus, when investing in plant and financing its maintenance top management has to have in mind not only social difficulties but also the economic problems connected with bad working conditions.

3.1.1.4 Trade Unionists.

It seems obvious that the proper study of trade union leaders is working conditions. But it is often clear that workers think other social problems - employment, wages, pensions and social welfare - are the most important. Trade union leaders, in developing and developed industrial countries alike, have to make an effort to convince themselves as well as the workers that working conditions are inseparable from employment, wages and social welfare. There is no advantage in having a job, a wage, and a pension if accidents are many, sickness comes often, and a short working life ends in exhaustion.

3.1.1.5 Senior Labour and Social Security Administrators.

Officials responsible for drawing up and enforcing labour legislation and regulations are in the highest degree concerned with working conditions. But labour administrations all over the world have been known to make admirable regulations which for technical or economic reasons are impossible, or next to impossible, to apply. When temperatures soar in a factory in a tropical country with enormous glass walls facing South-West and a host of machines each with its heat engine, there is little to be done except knock the factory down and buy other machinery, or condition 20,000 or even 100,000 cubic metres of air.

The powers of labour administration must, then, be more concerned with technicalities, and its responsibilities limited to that stage of

the project at which the factory has not been built and machinery has still to be ordered. And senior labour administrators must not be trained purely and simply to make and enforce regulations.

The special teaching curriculum for all kinds of decision-makers is first and foremost socio-technical; the underlying principles of ergonomics are not explained to them in detail. First requisites are good statistics on employment injuries, breakdowns, occupational diseases, and labour turnover, and reliable financial assessments of the cost of bad working conditions, taking into account their incidence on production and the economy in general.

3.1.2 Engineers and Technicians.

Clearly, engineers and technicians are the people who create the technical set-up. The ergonomic knowledge essential to them is part and parcel of their technical training, and they have positively no choice but to acquire it.

As recommended by various international bodies years ago, engineers and technicians have necessarily to be given thorough ergonomic training from their schooldays onwards and also recurrent training on special problems which work done by man raises in their particular sector.

3.1.2 Specialised Groups.

Some persons on the staff of an enterprise, such as doctors, psychologists, and safety and organisation engineers, do work specifically covering human relations with the production set-up. They have to be not only competent in ergonomics but also potential instructors. They must accordingly have much more teaching.

3.1.3.1 Factory Doctors.

In many countries factory doctors do nothing but therapy, whereas

much of their work should be to assess the abilities of the working population and the epidemiology of the harmful effects of working conditions, to describe unfavourable working situations and make recommendations for their improvement. There are many examples of excellent training using this approach in South-East Asia (in India, Indonesia, Japan, Philippines, Singapore and elsewhere).

3.1.3.2 Labour Psychologists.

All too often, labour psychologists still work on staff selection or the psycho-sociology of disputes, whereas they should take the lion's share in investigating the causes of employment injuries and in work analysis in general. They are the people who can put their finger on the hidden difficulties in a technical set-up which lead to adverse behaviour, and they should bear much of the burden of ergonomic training.

3.1.3.3 Safety Engineers.

Safety engineers must take a decisive part in improving working conditions, especially as in many enterprises the tendency is to form a single "Safety and Working Conditions" department. Generally accepted views on safety must accordingly be widened, and orthodox activities such as applying regulations, using individual protectors, and safety posters or competitions be supplemented by vigorous use of ergonomic data and system analysis on the lines, for example, followed by the Total Loss Centre Training of the University of Hawai.

3.1.3.4 Organisation Engineers.

The present strong opposition to Taylorism in the industrial world is to a great extent legitimate; systematic Taylorism is by no means of value everywhere, and it is not the best system in much of modern industry.

But work still has to be properly organised. Ergonomy brings organisation

a very considerable volume of new, useful data which engineers have to assimilate so that useless workload can be cut down and confidence in the technical set-up increased.

3.1.3.5 Other Specialist Engineers.

It may be a surprise to find purchasing department engineers or new operations engineers on the list of specialised groups.

The fact is that officials buying machinery for their employers must be familiar with the standards relating to working conditions which it has to meet. Machines not up to ILO or ISO standards and unsaleable in some industrial countries must not be sold to enterprises in developing industrial countries.

New operations engineers are responsible for the removals and rearrangements so frequent in a factory. Each of these operations gives them a chance to improve working conditions which have long caused grumbling on the shop floor. They cannot do this if they are incompetent.

3.1.4 Socio-technicians and Ergonomists.

Every country and enterprise or group of enterprises needs high quality socio-technicians and ergonomists to give consultations and train other social groups.

It is ^{not} necessary to dwell on this general need, but every national background must be carefully studied so that the spirit and scope of these two specialities provide exactly what the country or enterprise requires, and models good in other circumstances are not incautiously adopted.

Evidently, to train such specialists calls for a great effort comprising two or three years of post-graduate training.

3.1.5 The Workers.

The workers' function in labour conditions is an immense subject, as yet relatively unexplored anywhere. This training should give workers a better understanding of their work and the dangers it entails, improve their behaviour and encourage them to propose improvements.

3.2 Training Methods.

Methods of training in working conditions are innumerable, if only in duration. This varies from the few hours of a seminar for decision-makers to several years for socio-technicians and ergonomists.

Differences do not end there. Much of the training has, of course, to be done at school as part of general training; this applies equally to metalworkers in their apprenticeship school and to the curriculum of would-be doctors, psychologists and engineers. Still more has to be done by recurrent training : existing staff has to be quickly trained; knowledge is soon out of date; and no one can go through life without adding to what he learned in his far-off schooldays.

Some training will be highly specialised; seminars will be held on working conditions in sugar growing-cum-refining estates or spinning mills, and specialists of various kinds - such as engineers, doctors, psychologists and labour inspectors - will be invited.

Some training will be in particular occupations, and ergonomic data can be submitted to factory doctors and research engineers.

For high-level specialists, or very restricted subjects such as working conditions in the merchant marine and data processing, international meetings are preferable. For South-East Asia it is certainly very desirable to hold numerous Asian meetings, particularly if they can get help from neighbouring countries such as India and Japan.

Teaching must be written as well as oral. There should preferably be a collection of books on socio-technics and ergonomics, and a scientific magazine on those subjects, for South-East Asia alone.

Brochures and popular newspapers might be very useful for mass dissemination.

4.0 CONCLUSIONS.

Working conditions are the result of extremely complex technical, economic and social phenomena associated with national geography, demography and anthropology.

One of the achievements of modern science is that it has better understood the relations between the various aspects of the situation and has suggested alternatives to apparently inadequate solutions.

The scope and complexity of the problems call for the services of large numbers of experts and informed action by many social groups.

To improve existing conditions, and particularly to build good working conditions up from the beginning in new production centres, there must be ample facilities for information and training.

The social consequences of such efforts are fewer employment injuries and less occupational disease, fatigue, absenteeism and labour turnover. Their economic consequences are less financial loss through breakdowns, better quality goods and a steadier flow of production; greater reliability of complex computerised and automated plant; and better use of material and spare parts, leading to fewer imports.

The ILO can play a very important part in this work, particularly if it can draw up regional training plans for South-East Asia.

Text of paper
D. H. Brown

D. H. BROWN

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LIST OF PROPOSALS OF Mr D. BROWN RECEIVED BY A. WISNER
IN CONNECTION WITH PIACT *

- 1 X - Developing a screening test for workers on high rise buildings
- 2 X - Personal protection against hostile environment, travelling exhibition
- 3 X - Development of special work clothing for hot environment in the tropical country of Asia
- 4 X - Seminar on rural safety and health for the asian region
- 5 X - The design of factory buildings for the tropical countries of Asia
- 6 - Occupational safety posters for the developing countries of Asia
- 7 - The english of occupational safety and health
- 8 - The safety consultant's game
- 9 - The briefing of experts on aspects of PIACT
- 10 - Technical ^{articles} ~~aspects~~ for the journal of certain learned and professional societies
- 11 - ^{teaching} ~~technical~~ materials - Safety models and illustrations
- 12 - Safety manual for Bangladesh

* The proposals that are preceded by a cross (X) have been commented by A. WISNER in some notes joined to this list.

DEVELOPING A SCREENING TEST FOR WORKERS ON HIGH RISE BUILDINGS
a RB/PIACT project proposal

Background

1. Statistics show very clearly that certain types of work give rise to more accidents and injuries than others. Amongst the types of work that give rise to a proportionately larger number of accidents and injuries is construction work on high rise buildings. This trend is particularly noticeable in those areas of Asia where there is a concentration of building construction of tall buildings, for example, in the Republic of Singapore. The Annual Report of the Ministry of Labour in Singapore for 1975 has this to say about the problem.

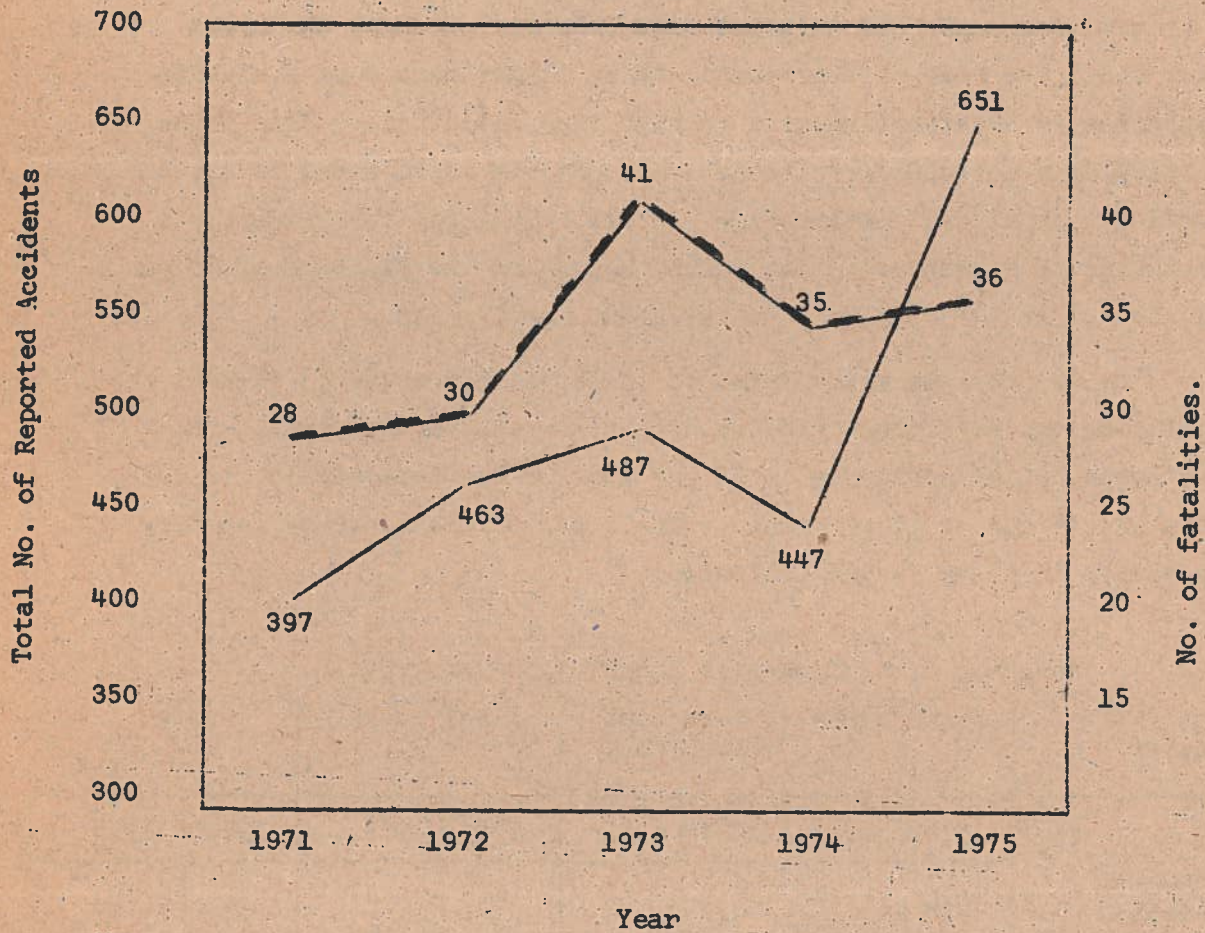
"As in previous years, most of the accidents occurred in the shipbuilding and repairing, and building construction industries, the former having 1,142 accidents or 30 per cent of the total accidents, and the latter 651 or 17 per cent. The detailed breakdown by industry and severity is given in the following:-

2. Analysis of Accidents by Industry and Severity

Type of Industry	Minor cases		Permanent Disability		Fatal cases		Total	
	1974	1975	1974	1975	1974	1975	1974	1975
Shipbuilding & Repairing	838	1,114	11	8	21 (38)	20 (21)	870	1,142
Building Construction	409	609	4	8	34 (35)	34 (36)	477	651
Other Industries	1,787	1,955	104	70	13 (15)	9 (10)	1,904	2,034
TOTAL	3,034	3,678	119	86	68 (88)	63 (67)	3,221	3,827

Figures in brackets denote fatalities"

3. Accidents in the Building Construction Industry



Legend

————— Reported Accidents 397 - 651

----- Fatalities 28 - 36

4. It will be noted that while there are fewer total accidents in building construction than in shipbuilding and repairing there are more fatal accidents. 34 as against 21 in 1974 and 20 in 1975. However in 1974 one single "accident" in a ship's engine room caused the deaths of about 12 persons. And so in Singapore, building construction accidents account for about half the total fatalities reported to the Chief Inspector of Factories.

5. Investigations of the accidents occurring on high rise buildings reveal a large number of falling accidents. The majority of these falls are within the structure of the building with only a relatively small proportion involving falls from scaffolding on the outside of the shell of the building. Most of these falling accidents within the building occur to workers of various types constructing the interior of the building, and involve falls through large openings in floors, stair wells and other parts of the incomplete building.

6. The victims of these accidents are often workers who have not previously worked at heights and the accidents often occur shortly after they start work at a height. The account which these injured persons give after the accident is very consistent. They nearly all say that they became dizzy apparently suffering from vertigo because of the height they were working at and then they fell down. This is the account that is repeated over and over again, "I became dizzy, lost my balance and fell down" or words to that effect.

7. This seems to be the basic problem - that certain workers both men and women, when they go to work at heights are liable to suffer vertigo become dizzy and giddy, lose their balance and fall.

8. This accident problem is acute in Singapore and the writer has had numerous discussions, with factory inspectors who have investigated these falling accidents, with medical officers, university staff, supervisors on work sites and others, on the problem and on how to prevent falls. A good deal can be done and is done by endeavouring to make the place of work as safe as possible under the construction conditions. But when a worker becomes giddy and dizzy all this guarding is of limited value in preventing a fall.

9. Almost all the discussions and deliberations on the problem have come back to one issue. Is there a method of identifying a worker who is likely to suffer temporary giddiness or vertigo at heights and to use this method to test new workers and so screen out those accident prone at heights. So far no satisfactory method or screening test appears to have been devised and so falling accidents continue to occur at a high rate on high rise construction work in many parts of the world, such as Singapore, Hong Kong, etc.

10. The PIACT programme recognises the problem of the most hazardous jobs. Special attention requires to be given to these and research into such hazards should be undertaken.

11. This project proposal is to undertake operational research into this problem with the aim of devising a screening test capable of identifying those men and women are prone to vertigo - dizziness at heights. The aim is to provide the construction industry with (hopefully) a relatively simple test, for all their new employees so that they can identify those unsuited for work at heights because of their liability to dizziness.

12. It is proposed that this operational research should be undertaken partly in the research worker's own institution but mainly with the research worker being attached to the Department of Social Medicine and Public Health (under Professor W.O. Phoon) at the University of Singapore. There is much interest in this subject in Singapore as the problem is acute there, because of the concentration of high rise construction in a small area, and research of this nature is likely to be welcomed and given all possible assistance by the government and the Singapore Housing Board as well as the building constructors who are anxious to find a solution to this serious accident problem.

13. The research worker would probably be a physiologist or ergonomist and initially would pursue the research approach outlined below to see if it produced a satisfactory method. (If the approach proved unsatisfactory he could try out other methods).

14. The research worker would naturally make a search of the literature and collect information from government inspectors and other sources.

15. As to the research method proposed the aim of this is to reproduce, as far as possible, the visual sensation of being at a height and to assess the subject's reaction through measuring galvanic skin resistance, pulse, respiration, blood pressure and other parameters. All this would be carried out in a small simulator sited either in a laboratory or at a construction site. The test population would be newly engaged workers or those about to work at heights for the first time. In addition workers who had reported being dizzy, irrespective of whether they had or had not fallen down, would be another population for examination. Others also would be included in the design of the experiment.

16. To reproduce the visual sensation of being at a height it is proposed that three-dimensional or stereoscopic photography be used. The research worker, who might probably first have to acquaint himself with three-dimensional photographic techniques and three-dimensional projection would use a 3-D camera taking standard 3-D pairs of photographic transparencies. He would photograph a variety of real life scenes taken high up on building sites. These 3-D photographs would show scenes exactly as they are observed by workers working at those heights. Many of the photographs would be taken looking down through the building structure which is the type of view that seems to be mainly responsible for precipitating the sensation of giddiness in workers.

17. Once a good set of photographs which reproduced closely the views in full three-dimensional, i.e., stereoscopic vision (and therefore are virtually identical to the real life situation) had been obtained then the small simulator would be constructed. This would consist essentially of a good quality 3-D hand viewer, or a 3-D projector using a small screen approximately 4 ft square so the scenes could be viewed by the subject. All would be enclosed in a small cubicle.

18. During the experimental sessions the subject would sit on a chair connected up to the recorder which could, for example, be a Polygraph Model RP-4 manufactured by Takei & Co. Japan, measuring at least galvanic skin resistance, pulse rate, respiration and blood pressure readings continuously. Then a scene identical to what he would see from a working position high up in the building would be projected and the subject would see it in full 3-dimensions. It would be virtually identical to being, as far as visual sensation is concerned, in the real life situation. The body readings would continue to be noted and recorded. Other scenes presenting a visual sensation of lower or greater height would be projected. And so the experiment would proceed.

19. The simulator once constructed and working satisfactorily could be transported to a construction site for the convenience of the subjects to be tested.

20. This is only the outline of the proposed experimental method, the scientist would extend it, select his subjects, carry out the statistical or epidemiological studies involved, and so the research would go on.

21. The work could be started in the research worker's own institution and then be continued in Singapore at the University under Professor W.O. Phoon, who could be expected to be interested in such a research project and to give it full support.

22. The writer (D.H. Brown) has, as a hobby, worked in the field of three-dimensional photography for a good many years and can testify to the extremely life-like scenes that can be depicted. When people see them they react very much as in real life - and will, for example, sometimes gasp with surprise at a striking view.

23. It is suggested that an opinion on the experimental procedure outlined above be obtained, preferably from Professor A. Wisner, Director of the Laboratory of Work and Engineering in Paris, who is believed to be interested in such research.

24. As he is very knowledgeable on such matters Professor Wisner might also be able to suggest where to find a suitable research worker in the field of physiology or ergonomics competent in 3-D photographic techniques.

25. This research would appear to be particularly suitable for a young scientist wishing to work for a Ph.D., who could use this as his research.

26. It is understood that some 3-D research work has been undertaken in/^{the}University of Edinburgh and this is thought to be in the department dealing with optics. A useful source of information on 3-D techniques is the Three Dimensional Society in UK (which in fact has members from all over the world).

27. Although it is suggested that the project be carried out in Asia it has wide applications around the world, and could if successful do much to reduce falling accidents on building sites.

Objectives

28. To devise a scientific means of identifying and screening out subjects liable to be accident prone due to dizziness - vertigo - when working at heights.

29. Scientific research into this is proposed employing a research worker in the field of psychology or ergonomics. His experimental method would include three-dimensional photography and measuring body reaction to simulate visual conditions found in high-rise building construction work.

Inputs

30. One research worker, initially for 2 years. Some apparatus including one standard 3-dimensional camera, 3-dimensional hand viewers and 3-dimensional projector.

Recorder such as Takei & Co's Polygraph Model RP-4.

Other apparatus and equipment.

Research/...

Research facilities in the research worker's own institute and
at the University of Singapore.

Estimated Budget

1 Research worker (initially) 2 years	US\$55,000.00
Travel	10,000.00
Equipment	20,000.00
Other incl. books	<u>10,000.00</u>
	<u>US\$95,000.00</u>

DHB/ca
19.1.1977

DEVELOPING A SCREENING TEST FOR WORKERS
ON HIGH RISE BUILDINGS

(D.B.1)

- The research project prepared by Mr D. BROWN is related to a very difficult question, the loss of equilibrium among workers of building industry who suffer from ~~some~~ many fatal or very serious accidents related to falls from big height.
- It is not a problem special to South East Asia for there are so many countries in the world with high rise buildings. But it is good that now some general working conditions problems are taken in hands and well treated by South East Asia researchers.
- In the problem considered, 3 aspects are at least involved. The first is the capacity of the workers to maintain a good equilibrium at earth level. The equilibrium is maintained with the help of informations coming from 3 sources : peripheral vision, vestibulum (inner ear), proprioception and exteroception (sensation coming from articulations, muscles and skins of the legs). The difficulties can be initiated by each of the source or by the coordination of them. Some very simple approach are classical; for example the ROMBERG test : the subject stands with his feet one before the other and closes his eyes. He falls very quickly if his vestibular or proprioception system is alterated. A little more complicated technique allows the exploration of peripheral vision and is used in some researches in our laboratory. The subject is moved on a small trailer and simultaneously his visual environment is moved in the same or an opposite direction. The expression of desequilibrium is either fall or in a more subtle way, changes in the electromyography of legs muscles.

- Another aspect of the loss of equilibrium is the so called "vertige" where somebody feels he will fall and presents some signs of anxiety if he is looking to the ground from a high position. This can appear even if there is absolutely no risk (being in a caged balcony). The suggestion of Mr D. BROWN is related to this aspect ~~to~~ of the loss of equilibrium. The experimental situation (3 dimensions photographs) and the biological tests he proposes are quite convenient. I would like only the subject not to be seating but standing.

- The third aspect that has to be considered is the relation between the work activity and the postural regulation. There are sometime strong contradictions between the organization of the movement and the organization of the posture to maintain equilibrium.

- At last, there is now some doubt of the absolute value of selection in general except for the extreme 5 % (- 2 %). There are so many factors combining each other in a rather variable combination intersubject and intrasubject.

- Some other approach has to be combined with selection. In this case, it could be training and safety equipments like safety barriers around each unprotected opening and safety harnesses *avoiding* too big falls.

Suggested Action on this proposal.

1. ILO to study and, if necessary, amend this draft proposal.
2. Approach UNEP and discuss.
3. If agreed, in principle, then draw up a project proposal acceptable to UNEP and ILO.
4. As part of 3 above, carry out accurate costing.

PERSONAL PROTECTION AGAINST HOSTILE ENVIRONMENTS.

a ILO/UNEP project proposal

An ILO/UNEP project proposal.

Objective.

1. This project is concerned with making more widely known the hazards of hostile environments through the use of a travelling exhibition which would display some of the equipment and apparatus available for the protection of the individual human being against environmental hazards. The project would be concerned with the total environment, including the working environment.

Background.

2. Educating the public to understand and realise the hazards of hostile environments which exist calls for a wide variety of methods and approaches. Amongst these is the use of small exhibitions, such as have been successfully used in different parts of Asia, e.g. in Bangkok. However, these exhibitions have tended to present rather technically complicated information, e.g. newer methods of sewage processing, techniques of air pollution analysis. In consequence they reach a limited audience.

3. To reach a wider audience it would be more effective to appeal to an aspect of human interest common to most people, the personal protection of the individual person, the protection of the individual man,

woman/...

woman and child. For example, most people are more deeply impressed by looking at a gas mask or respirator worn on the head of a (plastic) human figure than they are by drawings showing an air purification system for a whole building although both types of apparatus could, under certain circumstances, provide protection against the same hostile environment.

4. To gain maximum impact on an audience only personal protective equipment should be shown. Such equipment is designed to protect the various parts of the body and the various systems of the body against hostile elements of the environment. For example, this might be against exposure in the sea using the new suits that enable a person to keep warm and alive in icy water for several hours instead of dying from exposure in a few minutes; it might be the protection of a person wearing dark clothing at night, while walking on busy roads with no sidepath or sidewalk and liable to be struck by passing vehicles, by using built-in reflectance so that even a dark suit shows up brightly in the reflected headlamp beam of a vehicle; or it could be a miner working in a coal mine and exposed to fine dust liable to cause pneumoconiosis and therefore wearing the latest lightweight helmet-type respirator with a built-in electrically operated filtration system so that only pure air reaches the miner's lungs; or a worker near the aerials of powerful radio transmitters wearing the special wire-mesh head-covering to prevent the radio waves damaging his central nervous system; or deepsea fisherman sailing in cold oceans wearing the new all-weather clothing that enables them to work in extreme conditions; or the new diving suits that enable deepsea divers to go to far greater depths than previously by using the new design of suits making use of the structural techniques devised centuries ago in the coats of armour worn by knights in battle, or the exhibit could be the special cold weather suits devised (and tried out in the Himalyas) for building and construction site workers and which have enabled european motorway construction to be completed on schedule despite very adverse weather conditions; or it might be individual high-frequency vibrators for use in rural areas, especially in forestry and similar work, to repel insects that may carry disease.

Details/...

Details of proposal.

5. This project proposal is to set up a travelling exhibition of the type described above and send it on tour around the ILO/UNEP Asian region.

6. The exhibition itself would be made up primarily of exhibits of personal protective equipment against the hazards of hostile environments. In the Appendix is listed some of the specific items of personal protection and general items that might be included, and some illustrations have been added. This is a tentative list only and could be varied considerably.

7. To obtain the exhibits it is suggested that the manufacturers of the equipment should be approached and invited to take part in the exhibition by providing, on long-term loan, samples of their equipment. It could be arranged with the manufacturer that if the sample gets lost or stolen or badly worn he replaces it by a new one so that the exhibition items always look neat and fresh. If a new model is brought out, the manufacturer should change the older model for this new one. The local agent of the manufacturer in the town where the exhibition is on view at any particular time could assist with all this. And of course the agents should be invited to the exhibitions opening. As the manufacturers will in effect be receiving some free advertising for their products most will be only too willing to comply with these requests - as is done with other types of exhibition.

8. The exhibition should be fully provided with stands, showcases, labelling, portable lighting, even possibly the rope barriers for guiding the public through the exhibits. This would all be prepared by a commercial studio specialising in display work.

9. Special boxes and small crates would be made to fit and carry the exhibition. These would be robust, lightweight, re-useable boxes specially designed for ease of packing and unpacking so that the exhibition could be easily unpacked, placed on display for a week or two and then everything easily repacked. Each box would be labelled showing which

exhibition/...

exhibition piece fitted in and how. A complete master plan of the packing and unpacking arrangements would be provided so that at each new destination it would be clearly seen what had to be done.

10. A display plan would show the requirements for the exhibition, the floor area (with alternative arrangements for different shaped rooms) electrical connections and any other services so that it would be easy to select a suitable display room.

11. In addition to all the exhibition items of the type listed in the Appendix which should of course be well displayed, be colourful and attractive, it would be desirable to include just a few books and photographs dealing with the various aspects of hostile environments. The book display should be kept small however and there must be no question of the exhibition becoming a book exhibition as this would affect its educational character and greatly reduce its effectiveness and the audience which it would attract.

12. One other item in the exhibition would be most useful in providing a focal point and adding additional life to the exhibition. This would be a "sound-on-slide" presentation. One of the standard sound-on-slide projectors, which project on to a back projection screen for daylight viewing, ordinary 35mm colour transparencies while giving a recorded commentary on each slide up to 2 minutes per slide could be used.

13. A sequence of slides dealing with the various items in the exhibition could be used and to these would be added other slides showing scenes from everyday life, at home, at work, at leisure dealing with some of the environmental hazards encountered. Each programme could last about $\frac{1}{2}$ - 1 hour. The programme would be presented at scheduled times during the period the exhibition was open. (This arrangement of a focal point using a sound-on-slide projector was most effectively used at the recent exhibition on Thai silk held in the Bangkok Intercontinental Hotel when a sound-on-slide projector loaned by a UN agency showed the production and use of Thai silk).

14. The exhibition would be sent on tour around Asia. Arrangements for setting it up could be made through suitable local bodies such as;

- (1) any UNEP office
- (2) any ILO office
- (3) any other suitable UN agency office
- (4) any environmental group such as a public society or government department who would like to use it.

15. The location of the room for the exhibition is important.

To obtain maximum audience exposure it is desirable to have the exhibition in a suitable room attached to an existing exhibition or display centre, or failing this in a large departmental store, at a major railway terminus or in a busy first class hotel. What is not a good arrangement is a room, say in an office block, to which the public have to make a special journey in order to view the exhibition.

16. When the exhibition has been set up a formal opening might be arranged according to the wishes and knowledge of the local group. Press, radio and television coverage could be arranged. If convenient a meeting with a speaker, possibly a government speaker, or a film on an environmental subject might be arranged for the opening. Various other arrangements could also be used such as an opening reception with light refreshments.

17. The exhibition would be open to the public and special groups from colleges and schools; environmental organisations and local societies would be invited to make special visits.

18. Leaflets dealing with the exhibition would be distributed to those visiting the exhibition to reinforce the message concerning hostile environments and personal protection against the hazards.

19. Initially such an exhibition would use English as the medium of communication, and visit areas where English is widely understood. Later, after experience had been gained additional languages might be added and the circuit widened. Bilingual members of the local ILO or UNEP office might give a talk in another language at stated times but any interpreter who might be used should have some technical knowledge.

Estimated Budget.

20. This would have to be costed in detail. It would include any personal protective equipment bought for display, cost of display stands and cost of prefabricating the special cases all as carried out by the commercial studio, books and sound-on-slide apparatus and presentation, freight to different parts of Asia, rent of display area, leaflets printing costs, publicity, small receptions and incidentals.

The total cost would be for UNEP/ILO financment.

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Footnote

This type of travelling exhibition is used by various bodies such as l'Alliance Francaise and the British Council who send exhibitions of paintings, sculptures and of books, etc., on tours which may last a year or two and take the exhibition right around the world. Before the exhibition arrives a suitable room or hall has been selected according to the full specifications supplied and these give full details on how to unpack the special exhibition cases, set up the exhibition, illuminate it, store the empty boxes and then repack and despatch the exhibition and send on to its next destination.

Appendix

Protection against exposure in the sea using the new suits that enable a person to keep warm and alive in icy water for several hours instead of dying from exposure in a few minutes;

The protection of a person wearing dark clothing at night, while walking on busy roads with no sidepath or a sidewalk and liable to be struck by passing vehicles, by using built-in reflectance so that even a dark suit shows up brightly in the reflected headlamp beam of a vehicle;

A miner working in a coal mine and exposed to fine dust liable to cause pneumoconiosis and therefore wearing the latest lightweight helmet-type respirator with a built-in electrically operated filtration system- so that only pure air reaches the miner's lungs;

A worker near the aerials of powerful radio transmitters wearing the special wire-mesh head covering to prevent the radio-waves damaging his central nervous system;

Deepsea fishermen sailing in cold oceans wearing the new all-weather clothing that enables them to work in extreme conditions;

The new diving suits that enable deepsea divers to go to far greater depths than previously by using the new design of suits making use of and incorporating the structural techniques devised centuries ago in the coats of armour worn by knights in battle;

The special cold weather suits devised for building and construction site workers and which have enabled European motorway construction to be completed on schedule despite very adverse weather conditions;

Individual high-frequency vibrators for use in rural areas, especially in forestry and similar work, to repel insects that may carry disease.

Smog masks as used by civilians in some cities.

Boots and leggings, puttees or spats (including quick release leggings using Velcro fastening) as used in jungles to protect against snake bites, and bites of other wild animals and as used by moulders in foundries to provide protection against molten metal and sparks.

Ear protectors or ear muffs for protection against loud noise such as jet engines. Especially the ear muffs with a built-in radio receiver allowing music to be "piped" to the wearer or enabling his supervisors to speak to him. Other ear protection as used by musicians, e.g. "pop

groups/...

groups" who are liable to suffer noise induced deafness from the loud noise of their electronic instruments.

Riding hats for horse riders.

Hard hats of various designs and types for use in a wide variety of occupations.

Face shields, for protection against flying objects.

Motor cyclists crash helmets.

Safety "bump caps" for motorists, to prevent head injury.

Brightly coloured ropes as used on hazardous climbs on glaciers and mountains.

Oxygen supply for police exposed to heavy traffic fumes (as used in some European cities).

To combat the risk of skin cancers from the combination of sun and certain dusts, e.g. asphaltic dusts produced during certain road building processes, wide brimmed hats or other sun protection. These also protect against sunburn and against rain, particularly in rural work.

Dosemeters for measuring finger, hand and body ionising radiation exposure, when using radioactive substances.

Goggles of various types, for eye protection, and safety spectacles.

Safety boots and shoes, (display the cut-away version).

The white sun umbrella supported in a policeman's belt in some tropical countries to protect him against the sun, as he stands on traffic duty.

Bright red "lipstick" ointment as used by climbers to protect them against risk of frost bite or skin damage. Being bright red its absence is quickly noticed by the climber's colleagues.

Wellington boots with steel toe PLATES and sole plates.

Sports clothing including yachting clothing and glider suits.

Carbon dioxide inflatable floats for personal use in water.

Positive pressurised air masks.

Climbing boots.

Car safety belts and car, explosion type bag restrainers.

Dust masks for asbestos, silica dusts, etc.

Fireproof suits for firemen, etc.

Non-flammable material for children's night clothes etc.

Special gloves for use at work, on the road, in severe climates.

Ergonomically designed pliers, which are a different shape from ordinary ones.

Safety belts and harnesses for industrial use.

Ergonomically designed suits and clothing.

Fresh air breathing apparatus.)

Self-contained breathing apparatus.)

Oxygen breathing apparatus.)

all for use in hazardous environments

Barrier creams to protect the hands against acids, alkalis, oils.


Sweat bands for use in the tropics.

Hard hats with attachments such as ear muffs or welding face shields.

Leather ant-bite suits for dog handlers to protect against risk of rabies, etc.

Personal oxygen supply for guests as now provided in the world's highest altitude hotel.

The special water cooled suits as used by pilots of high speed aircraft, astronauts on the moon and glass furnace workers.



PERSONAL PROTECTION AGAINST HOSTILE ENVIRONMENT

TRAVELLING EXHIBITION

(D.B.2.9)

This idea is basically an excellent one. It has been used with success in India with the Exhibition truck of the Central Labour Institute of Bombay. It helps people to understand at least that some personal protection could be used in many dangerous circumstances.

But this idea has to be deeply studied to avoid a situation that could be completely exterior to the visitors. For example, we know very well that school children and even students don't fully realize the dangers of work and cannot understand very well the necessity of personal protection.

Another problem is the cost of a lot of these protection equipments in situations where very little money is available for the workers.

We can consider also the lack of serious interest of workers of a special area (agriculture for example) for equipments related to activities they have never seen or imagine (steel works for example).

So this exhibition has to be different for the different professional groups and the different level of resources devoted to workers protection.

This travelling exhibition is much more efficient than one ^{staying} ~~staying~~ in a city like a museum, but it is much more expensive : salaries and travel expenses of at least 3 people. This budget is much more important than the price of the exhibition itself.

Development of Special Work Clothing for Hot Work
Environments in the Tropical Countries of Asia.

Background

1. Of the various environmental factors which affect man at work one of the most important is the thermal conditions to which he is exposed. These thermal conditions may result in the man being cold, comfortable or hot. Ideally, man should work in thermal conditions which do not place any stress on his body. Extremes of temperature, hot or cold, tend to cause stress, but cold is the easier to deal with as the worker can wear additional suitable clothing to keep him warm. Dealing with hot conditions is much more difficult, and can readily cause stress to the body. This is not only harmful to the body but reduces efficiency and leads to an increase in errors which in turn can cause accidents and injuries.

2. It should be borne in mind that the sources of heat are two-fold. Firstly, there is the heat in the working environment. This may reach the worker by the process of radiation, for example from furnaces, by convection currents which is the most common route by which heat reaches the body, the hot currents of air enveloping the body, and there is also conduction. Sometimes drivers of factory vehicles receive some heat from the engine transmitted through the seat of the vehicle. But this is a minor source of heat, convection currents and radiation are the two principal sources.

3. The second source of heat is that generated by the body itself. As we do work, or even simply move about our muscles produce heat as a by-product and the body has to get rid of this heat. A man carrying out hard manual work, e.g. shovelling material will produce much heat which he must get rid of. Someone engaged in a sedentary occupation will produce little heat.

4. The greatest stress to the body is therefore produced where moderate or heavy work is involved, and the working environment is hot. However, there are other factors to be taken into consideration and these concern the methods by which the human body acts to lose heat; either heat produced by its own muscular activity or heat absorbed from the surrounding working environment. The body uses three methods to lose heat. First we have vaso-dilation where the surface blood vessels expand and bring a greater flow of blood up to the surface of the body. The skin looks reddish as opposed to white when it is cold. The blood carries the heat from the muscles and the more blood reaching the surface of the body the greater will be the loss of heat to the surrounding atmosphere, provided of course that the surrounding atmosphere is at a lower temperature than the body. The second method is a muscular effect on the surface of the body which causes the maximum skin to be exposed to surface air movement. Hair tends to stand erect thus allowing the air movement to reach closer to the skin. (This can often be seen clearly in a dog during hot weather).

/5. These

5. These two methods of losing heat tend to deal with only small quantities of heat. Where more heat has to be got rid of the body uses its most powerful means of getting rid of heat - the body sweats. That is - a fluid is secreted in considerable quantity on to the surface of the body. This fluid which is mainly water evaporates and to do so requires quite a large amount of heat (to change liquid at one temperature into vapour at the same temperature). This latent heat of evaporation is quite large and so sweating is a powerful method of cooling the body.

6. These three methods of getting rid of heat thus assist the body to maintain normal temperature (the body core temperature of 36.9°C or 98.4°F) and these methods depend upon a number of factors. These include the degree of air movement reaching the body, the temperature of that air and, very important, indeed, the humidity of the atmosphere. The last of these is very important where the body is sweating a good deal. Air at any given temperature can only hold a certain amount of water vapour and its relative humidity (the ratio of the amount of water vapour present in the atmosphere to the amount required to saturate the atmosphere at that temperature) is vital. The nearer the atmosphere is to saturation the greater will be the difficulty of the body in sweating effectively. This can often be observed in hot, humid climates where profuse sweating may be taking place, most of the sweat is running off the body instead of being evaporated and so helping to cool the body.

7. In these comments about the heat control methods we have made no mention of acclimatisation which is of some importance. The human body tends to become acclimatised to the (thermal) conditions to which it is normally exposed, but this is only true over a certain range of conditions. Outside of that range the body cannot acclimatise.

8. Working conditions, particularly inside buildings (as well as in the open air in very hot climates) can be hot and humid and give rise to the harmful effects described at the beginning of these comments.

9. Now an important factor in the total thermal condition of the body is the clothing worn. The clothing can have marked effects on the body's ability to lose heat, and the body's tendency to collect heat. The colour of the clothing, the type of surface, the material, the porosity, the nature of the seams, the ability of the clothing to provide an enlarged area for evaporation and therefore cooling, the ability to allow much air movement close to the body surface, its effect on vaso-dilation and skin surface movements, the tendency to cling to the body when moist with perspiration etc.; all these are important. Important too are the designs, fitting, cut, shape of the clothing. Much of this is based on tradition, culture, religious or other factors. And not much thought has been given to the design of the clothing worn in most parts of developing Asia from the point of view of the weight distribution, pressures etc., especially where the worker carries weights, or carries tools, etc.

10. All of this adds up to a somewhat complex situation as far as the design of clothing is concerned. Now for a certain amount of work particularly in the hot industries, such as iron and steel foundries, rolling mills, work with furnaces, and so on and also where there is high humidity, such as in dyeing, laundries or where artificial humidification is used as in the cotton industry the comfort of the worker, or the degree of heat stress to which he is exposed can be ameliorated by the design of his work clothes.

11. In the tropical countries of Asia (and other parts of the world) we have a situation, in the hot industries in particular, where working conditions could be improved by the design of clothing best suited to the conditions and the worker. The design of clothing along ergonomic lines would be a significant step forward in the humanisation of work. It could also help production.

12. Men have been reported as working in a steel rolling mill where the dry bulb temperature was as high as 260°F (water boils at 212°F!) as recorded by research workers from Calcutta University.

13. In the developed countries the problems of clothing design have usually been associated with cold and wet conditions. The applications of ergonomic principles are much the same, scientifically, whether the problem is one of hot or cold. It is said that one major motorway across Britain was only completed on time and under most adverse environmental working conditions because of the special clothing designed by Mr. Farr, who is an authority on the ergonomic design of clothing. Farr is also responsible for the design of the special clothing now being increasingly used by deep sea fishermen around northern Europe and which has markedly improved their working conditions. Recently Farr took up the post of head of the design section of Hong Kong Polytechnic, where he is now concerned amongst other things with clothing for tropical countries.

14. A small amount of introductory research work on the design of special work clothing for hot industries in tropical conditions has been carried out under Dr. Sen in the Work Physiology and Ergonomics Laboratory of Calcutta University.

15. During the recent mission to Hong Kong of the Senior Occupational Safety and Health Officer he visited the Polytechnic and had discussions with Mr. Farr. Mr. Farr is very well aware of the problems discussed above and indeed very interested in them as the ergonomic design of clothing is of course his speciality.

16. During missions over the last year or so the Senior Occupational Safety and Health Officer has discussed with government officials in a number of countries including India, Sri Lanka, Bangladesh, Singapore and the Philippines this problem of the need for special clothing for Hot Work Environments in the Tropical Countries of Asia. All have expressed interest and - in so far as they could comment on the spot - have said their country would be interested in investigations in this field.

17. It is our view that a full regional project would bring beneficial results. But before embarking on a full project it is proposed that an introductory or preparatory project be set up to study in more detail the existing situation; its needs and therefore the methods to be adopted in the full project. It is suggested that the Consultant for the preparatory project be Mr. M. Farr, Head of the Design Department of Hong Kong Polytechnic. He is an expert in the field, is interested in the problem, and from the recent informal conversation with him it appears that he could have leave of absence from the Polytechnic for a short period to carry out such a consultancy. It is, apparently, also the policy of the Hong Kong Polytechnic to support such endeavours.

18. The Consultant could be based on Calcutta University in Dr. Sen's Department of Work Physiology and Ergonomics and possibly also for a time at the CLI Bombay. By working through these bodies the Consultant should have fairly ready access to industry. It is suggested that the Consultancy work be carried out during the summer months in the northern hemisphere.

19. In addition to this 2mm Consultancy it is suggested a small sum of money be made available for portable equipment to be used by the Consultant in his field investigations.

20. After this preparatory project has been carried out and feasible, full project details drawn up, it is proposed that we then contact the governments in the Region with a view to a Regional project emerging.

21. These proposals are very much in line with the quest for new technical approaches to OS&H and with PIACT and it will also be noted that there is a TCDC element involved. For those who are employed in the hot industries of tropical Asia this project could help to make their work more human.

Long Term Objective

22. The development of the total design of special Work Clothing for use in Hot Work Environments in the Tropical Countries of Asia. The designs, once developed, would be made freely available for manufacturers to take-up and use.

Immediate Objective

To carry out a preliminary 2 man month consultancy to draw up a full Regional Project detailing the scientific and technical methods to be used for the development of Special Work Clothing for Hot Work Environments in the Tropical Countries of Asia.

Estimated Budget

	US\$
Consultant 2 m/m	7,500
Travel	1,500
Equipment (to be detailed by consultant) up to	2,500
Payment to University of Calcutta or CLI or other body for laboratory facilities	2,500
Secretarial assistance and miscellaneous	750
	<hr/>
Total	14,750
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DEVELOPMENT OF SPECIAL WORK CLOTHING FOR THE WORK ENVIRONMENTS
IN THE TROPICAL COUNTRY OF ASIA

(D.B.3.)

The problem of work clothing for hot work environments is an extremely important one and it is very well exposed in Mr D.H. BROWN paper.

A special attention has to be given to the work situation where other problems have to be treated simultaneously as protection against burning radiations, hot liquid or dangerous chemical projections.

There is a very important scientific and technical bibliography on the subject in western literature : U.K. and U.S. military research, European coal and steel community, Pr WYNDHAM researches in South Africa.

Little has been done in measuring working conditions in real situations of tropical countries. One of the best source in this field is the Work Physiology Laboratory in Calcutta directed by Dr SEN with the other Work Physiology Laboratories in India directed by his former students, Dr P.N. SAHA, in Central Labour Institute in Bombay, and Dr P.K. NAG in the Labour Institute in AHMEDABAD. A.W. had the occasion to visit the laboratories in BOMBAY and in CALCUTTA and he was one of the examiner of Dr P.N. NAG for his very remarkable Ph.D. presented before the University of CALCUTTA.

The only problem for these laboratories, specially the one of Dr SEN, is money. The lack of facilities is really extreme, and A.W. thinks that the ILO money available has to be given as far as possible to these institutions.

Another very good expert in South East Asia in the field of protection against thermal load is Pr JOSE of the Institute of Public Health of the University of the PHILIPPINES MANILA.

Of course, the capacities of Mr FARR, head of design section Hong-Kong Polytechnic has to be used but perhaps as a member of a team together with the indian and philippinese experts. At least it is difficult for ILO to suggest that Mr FARR will only use the facilities of the Work Physiology Laboratory of Calcutta University. Mr FARR would eventually be invited by Dr SEN to cooperate to a project given to the W.P.L. of Calcutta University. Another solution could be that Mr FARR would do his researches in Hong-Kong simultaneously to the researches of the indian and philippinese experts. These remarks stress the idea that scientific cooperation has to be organized by ILO in South East Asia in the area of working conditions.

a Rural Development Project
Regular Budget

Seminar on Rural Occupational Safety and Health
for the Asian Region

Background

1. There is an urgent need to provide the rural areas of the Asian region with support and help in occupational safety and health matters. For too long now the rural areas have tended to be neglected and in reports before the Governing Body as well as in discussion at the ILO Conference, the need to rectify this imbalance has been emphasised.

2. As a contribution, it is proposed that a Seminar on Rural Occupational Safety and Health be held in the Asian region, possibly at the University of Bali, Indonesia, where a significant programme of rural work is under the direction of Professor Manuaba, Department of Ergonomics. If it is not convenient to hold the Seminar in Bali, some other suitable place would be used.

3. The primary aim of the Seminar would be to produce an informative and authoritative book on rural safety and health for guidance and help in the rural areas of Asia for the next decade.

4. There is not available for the Asian region such a book and this gap should now be filled. (~~Some~~ *none* of the existing ILO publications meet this need).

Objectives

5. The basic aim of this Seminar is to meet the need for an informative, authoritative publication on Asian Region Rural Occupational Safety and Health for use during the next decade. A secondary aim is practical and realistic recommendations on rural safety and health. A further aim is an exchange of information and the provision of an educational input.

6. It is proposed that the seminar subject be divided into a number of sub-headings, probably 7 or 8 in all, such as;

/(1)

- (1) Chemical and biological hazards of rural work (largely excluding industrial activities).
- (2) Farm; agricultural and plantation health and hygiene.
- (3) Farm and agricultural safety.
- (4) Ergonomics for rural areas (concentrating on non-industrial aspects).
- (5) Small (rural) industry and handicraft safety and health.
- (6) Fishing.
- (7) Rural transportation safety.
- (8) Rural environmental pollution.

7. For each of the 7 or 8 subjects, an external collaborator would be selected and commissioned to:

- (a) prepare a paper on the subject (of about 30 pages, single spacing, including illustrations). Each paper would ultimately form one chapter of the book on Rural Safety and Health.
- (b) The external collaborator would present his paper at the Seminar and arising from the discussion on his paper and all the other discussions at the Seminar, the external collaborator would be asked to incorporate this into his paper along with such modifications as necessary.
- (c) He would submit his modified paper complete with illustrations, etc. within 2 months to ILO Regional Office for Asia, Bangkok.

8. The ILO Regional Office for Asia would then edit the 7 or 8 papers, and they, together with any supplementary material, would form the book on Rural Safety and Health.

9. The book would then be published and sold primarily within Asia, but would also be available on a world-wide basis.

10. The language of the Seminar and the book would be English but, if thought appropriate, extracts of the book might be translated into certain languages of the Asian region and reproduced in regional publications such as magazines, etc.

11. The external collaborators would be selected from experts in their respective subjects anywhere in the world, provided their knowledge is applicable to Asia.

12. In addition to the 7 or 8 external collaborators, approximately 16 participants would be invited to attend from the Asian region. These would be made up of 6 Government, 3 employers', and 3 workers' participants and 4 consultants from Asian universities or institutions who have specialised knowledge in rural safety and health matters of Asia.

13. The Seminar would thus be tripartite in structure.

14. The participants would be carefully selected from those with special knowledge of the problems of the Asian areas or with some special knowledge of apparent solutions to these problems.

15. The Seminar would consist of the presentation of the 7 or 8 individual papers. These would then be critically examined in one or two sessions. In general sessions, the interaction of the different subjects would be studied, and additional material added to the total dialogue.

16. A number of visits would be made throughout the rural area to see and study at first hand the conditions and problems.

17. The Seminar would last 7 days.

Long Range Objective

18. The 7 or 8 papers modified and extended as a result of the discussions and interchange of ideas would form the basic material for the book, which would contribute to rural occupational safety and health in the Asian region for the next decade.

Immediate Objective

19. In addition, the Seminar would be invited to make practical and realistic recommendations (reached by concensus) on rural safety and health for consideration within the Asia region by governments, employers' and workers' organisations and the ILO.

Implementation

20. Sixteen (16) fellowships would be offered in addition to employment of the external collaborators.

SEMINAR ON RURAL SAFETY AND HEALTH
FOR THE ASIAN REGIONS

(D.B.4.)

- This project is of great interest and the book expected as a result is of utmost necessity.
- The general program is excellent and the situation in DENPASAR UNIVERSITY - BALI quite adequate considering the work being done there by Pr MANUABA and his team.
- But A.W. is not sure that we are now able to collect the right experts for the very special tropical conditions. He is afraid that the speakers and book's authors will be mainly coming from developed, temperate or cold climate countries with highly mechanized agriculture.
- A.W. hopes that infact there are enough experts in rural Occupational Safety and Health in the different tropical countries of the world but there are not yet known.
- One of the questions systematically explored by the PIACT teams in the different countries could be the list of experts and research centers existing in the country or the region in the field of rural safety and health.
- The seminar suggested by Mr D. Brown could be organized in 1980 or 1981, along the lines suggested by Mr D. Brown but with a mixed team of western and tropical countries experts.

THE DESIGN OF FACTORY BUILDINGS FOR THE TROPICAL COUNTRIES OF ASIA.
(A Regular Budget Project Proposal)

Background

1. The development of the design of factory buildings from the industrial revolution to the present time in the developed countries has been the change, from what might be regarded as little more than boxes to house the first machines of the industrial revolution, to a structure now designed to meet two needs, firstly those of the machines and processes and secondly those of the workers. The needs of the worker include air to breath, light to see by and a reasonable temperature. The ventilation of the factory building must therefore provide sufficient air of an acceptable level of purity and so, according to the nature of the process the ventilation system must be capable of dealing with atmospheric impurities such as gases or dusts produced in the course of the work. The system must be able to deal with any humidity caused by the work and the system must also provide sufficient air movement to help to keep cool those engaged on heavy manual work. Heavy manual work causes the body to sweat in order to get rid of the heat caused by the work and the body cannot lose heat efficiently through the sweating process unless there is adequate air movement to allow the sweat to evaporate.

2. In the case of the hot industries the ventilation which may be natural or artificial, for example, making use of plenum systems, must be able to deal with the waste heat from the process to the extent of providing a working environmental temperature within the range acceptable for the nature of the work.

3. Adequate and suitable light must be provided to enable the workers to see without eye strain. This will normally take the form of natural light from windows and extensive roof lights or of artificial lighting including local lighting on machines and elsewhere. Special lighting may also be used. In addition there will be need to prevent glare whether it be disability glare, discomfort glare or reflections from surfaces of machines and equipment.

4. A suitable working temperature is also very important. This has been mentioned under ventilation but much more than ventilation is often necessary in order to provide an acceptable temperature. Three factors must be taken into consideration. There is first the load of heat produced by the process itself. If this is high, such as is found where furnaces are used then steps must be taken to reduce the amount of heat escaping into the working environment. This escape of heat will be mainly through convection currents and by radiation and measures must be taken to reduce these. Such measures include the use of lagging, radiation

screens/...

screens, and cooling of the air by various means. The second factor is the nature of the work itself. If this is of a heavy manual nature such as shovelling fuel into a furnace then a suitable working temperature would be a lower one than where, for example, the work being done was physically light such as operating a control panel.

5. The vital factor is that the human body only works efficiently over a limited range of temperatures and when it has to work in higher or lower temperatures human efficiency falls off and the worker suffers. In the long term damage would be done to his health, in the short term he is liable to make mistakes and errors and so increase the likelihood of having an accident and suffering injury.

6. The last factor of the three is the climatic conditions, in particular the temperature of the whole atmosphere surrounding the factory building. Clearly this will decide the temperature of the factory building itself based on the ambient temperature of the atmosphere along with radiant heat from the sun. And of course this will also settle the temperature of the air being used for natural ventilation as well as artificial ventilation, if the air is neither heated nor cooled. Now most developed countries are outside of the tropical regions of the world and the general climatic conditions tend to produce a cold, moderately cool or at most warm environment. This has had a profound effect on the design of factory buildings, especially as regards achieving a suitable working temperature. As often as not the need is to provide extra heat inside the factory. Or where the process does produce much heat only a small amount of ventilation may be necessary to cool down the working conditions.

7. And so, over the years, the structural design of factories in the relatively cool developed countries in order to deal with the thermal effects of the process and the level of energy expenditure of the workers has produced a certain balance. This balance is seen in the shape, construction and the degree of total enclosure of the building, the amount of ventilation, the window area and sometimes the geographical angle of the factory, e.g. to capture the sun's rays through south facing factory windows (for the northern hemisphere).

8. So in developed countries, factory buildings have evolved suited to the process and the relatively cool climate. For most processes the balance has been achieved without great difficulty but in the hot industries even in the cooler developed countries difficulty is often experienced in keeping down the working temperature.

9. Factories have been referred to in the above considerations but buildings that house service industries, parts of the transport system, have likewise evolved along the lines discussed.

10. Now/...

10. Now when we turn to the developing countries we note immediately that in the transfer of technology, the design of factory buildings have been largely transferred and used with little or no modification. The design of weaving sheds in cotton mills, of iron and steel foundries, of steel rolling mills, have by and large been taken over from the developed countries without significant change. There are a few exceptions, but they are indeed few.

11. Where the developing country has a tropical or semitropical climate it will be observed that the climatic factors that led to the evolution of the factory design in the developed country are no longer relevant. And so the design of the factory is unsuited to the tropical or semi-tropical climate.

12. Now it is precisely in the hot industries where the factory design proves most unsuitable and in consequence the workers suffer greatly.

13. As an example an iron or steel foundry in a tropical climate built to a traditional 'developed country' design, produce difficult and sometimes almost intolerable working conditions. High temperatures and possibly high humidity cause hardship and the workers suffer a great deal.

14. Some enlightened managements, especially where the factory manager has a professional background, e.g. an engineer rather than a business man, do make some attempts to ameliorate the conditions. In some foundries parts of walls have been knocked out, and large capacity air moving fans have been used to increase air flow and so on. But they have only minor effects as the original design of the building was unsuitable for the climate.

15. And so there is a very real need to tackle the basic problem of designing factory buildings suitable for tropical climates. The building must suit the climate.

16. There is a special difficulty in achieving this goal of designs for the climate of a developing country, and it is not always appreciated.

17. Most of the students of industrial architecture and design from the developing countries go and study the subject in the developed countries. And so they learn little of the needs of their own climates. As the Commissioner of Labour of one tropical country said recently "before we send our young men to study architecture in Britain or North America, I tell them I want them to come back able to design buildings for..... (and he named his tropical developing country).. "when they return, I find that all they can do is to design buildings for Britain or North America not for" And so the unsatisfactory designs are perpetuated.

Objective/...

Objective

18. The proposal is to start with the extreme case of the hot industries in the tropical countries. These could be studied with a view to evolving designs more suited to the tropical conditions. This may involve largely new concepts in the structure of the buildings, e.g. walls that can swing open or close according to conditions, the use of new building materials, e.g. glass that will not allow heat to pass through from the sun or better still a one-way glass that will only allow heat to escape from the building but will not allow the heat of the sun's rays to enter the building, and so on.

19. In these, and other ways, the heat load could be reduced and so working conditions for a large number of men and women made more tolerable. This would indeed help to make work more human.

20. It is proposed that a pilot project be carried out to assess the problems much more fully, seek out methods of approach and draw up plans for a fuller scale project to tackle a whole section of the problem area.

21. It is envisaged that a team comprising (1) an industrial architect, (2) an occupational hygienist, (3) a doctor and (4) a process specialist carry out the pilot study.

Long Term

22. The long term objective is to produce (1) new concepts in the design of buildings for the hot industries in the tropical countries, (2) to produce actual designs for one or two of the hot industry buildings such as a foundry and a steel rolling mill, (3) have these concepts and specific designs incorporated into the standard designs available throughout the world used by architects, industrial designers and others, (4) have them incorporated into industrial architectural training courses in the major colleges in the developed (and developing) world, (5) prepare proposals for the modification of existing buildings in the developing countries so that some improvement in the existing buildings could be achieved.

23. All this is to reduce the stressful and harmful working conditions and "make work more human" for the workers in the tropics.

Short Term

24. The short term objectives of this project is to establish the modus operandi for the full project. An area would be selected, possibly in Sri Lanka, India or Pakistan. The team, would study conditions in several of the hot industries in that area. The key member of the team would be the industrial architect (preferably a consultant with an engineering background) and he should be from or associated with one of the institutes of industrial architecture. He would co-ordinate the findings of the other members of the team and produce the report on which a full project could be based.

25. However/...

6. The modified version would then be translated into the language of Bangladesh - Bangla. This translation should be carried out in Dacca, arranged by the ILO Office Dacca. There are several institutes in Dacca who could do this, e.g. the Bangla Academy.
7. The illustrations in the booklet, wherever a human being is depicted would be slightly changed to ensure that the general features and style of dress etc. are those of Bangladesh.
8. The translation and modified drawings should be checked and if need be modified by the Chief Inspector of Factories Bangladesh to ensure that technical terms have been adequately translated into Bangla.
9. The agreed version would be printed in Bangladesh. A very substantial number of copies should be printed, say 10,000 using one of the cheaper forms of printing. Fairly large print should be used as many Bangladeshis have poor eye-sight and not all can afford reading glasses.
10. This supply should then be distributed over say a 12 month period through the government, mainly the Ministry of Labour, various training and teaching institutions and centres, and through the employers' and workers' organisations.
11. The Director of the ILO Office Dacca would personally launch the distribution by presenting the supplies given to the Employers' and Workers' organisations at a brief ceremony in the presence of the press.
12. Care should be taken to ensure a wide distribution within the country.
13. While most would be distributed free, a number, say 500 would be retained at the ILO (and possibly UNDP) office for sale at a nominal sum of, say, 1 Taka each.
14. Six months after the main distribution the Government, Employers' and Workers' organisations would each be asked for a short report on the reactions to the publication, its degree of usefulness and what further type of publication could be of special value in the field of Occupational Safety and Health.

25. However, the information collected by the team would of itself be of considerable value even if a fuller project did not develop.

Implementation

26. It would be particularly useful if the project could make use of existing or new scientific facilities in the developing countries such as the Sri Lanka Institute of Occupational Safety and Health. Working from such an Institute would facilitate the speedy and efficient execution of the project.

Estimated Budget

	US\$
27. 4 Consultants one each of an industrial architect, occupational hygienist, plant specialist (hot industries e.g. foundry industrial medical officer, 4 m/m processes)	14,000
Travel expenses	8,000
Provision of environmental equipment if possible on loan, including cost of transportation	5,000
Secretarial assistance	2,000
Miscellaneous	<u>750</u>
Total	<u>29,750</u>

THE DESIGN OF FACTORY BUILDINGS
FOR THE TROPICAL COUNTRIES OF ASIA

(D.B.5.)

- The research project is related to a very important question, is very well conceived and is able to obtain very practical results in a rather short period.
- It is closely related to our own recommendations based on observations and discussions in many tropical countries.
- It can be initiated in a very short delay as far as good evidence could be obtained of the capacities of the member of the team. A.W. has no special opinion on SRI-LANKA Institute of Occupational Health and Safety Institute. He thinks that some indian universities could contribute in a very efficient way as well as some philipine~~s~~ experts of the University of the Philippines.
- A report could be asked to some multinational firms or to a group of them. It would be necessary to specify that the report has to consider factories without air conditionning and of cheap construction. This or these reports could be financed by the firms themselves and not by any U.N. budget.

OCCUPATIONAL SAFETY POSTERS FOR THE DEVELOPING COUNTRIES OF ASIA

a R.B. project proposal.

1. As industrialisation proceeds within a country there appear occupational hazards which are new and unfamiliar to the workers. These arise from the introduction of machinery, plant, equipment and processes not previously in use or which are extensively modified from what was in use before.
2. The transfer of technology is in part a transfer of hazards as the workers are faced with new and unknown situations. And while the technical details and "know-how" of the process are transferred usually very limited effort is made to transfer to the workers "know-how" on the ways and means of how to deal with the hazards. Safe means of working are often only discovered by accident.
3. One method of alerting the workers to these new hazards is to present them dramatically through the visual senses. This can be done most effectively through the display of safety posters. These posters may teach through example, or warn by depicting the instant an accident is occurring, or they may motivate - often by associating a safe working practice with some desirable condition (such as family life or other pleasures).
4. Whatever is the approach, or the psychological angle used, experience over a good many years bears out the fact that well designed safety posters are effective in teaching, in warning and motivating.
5. Much of this experience has been gained in developed countries where there is a high level of literacy. It is therefore worth noting that in those developing countries with a much lower level of literacy, posters may be even more powerful in their impact. For the worker who cannot read, the picture depicted on a poster becomes more important, more vivid, for the inability to absorb information through the written word makes him more responsive to and indeed dependant upon what he sees (and hears).

6. The early stage of development is thus one where there is a special need to teach, to warn, to motivate through the use of safety posters conveying new information to the worker, but it is also a stage where the poster may be more effective than later on when the literacy level rises in the working community. Even at this more literate stage the safety poster can remain a powerful tool, particularly where its design and message is specifically aimed at the more literate observer.

7. The value of displaying posters is well recognised in the developing countries at government level, in industry and establishments as well as amongst voluntary bodies such as national safety councils. Requests are often made to ILO for the supply of posters, suitable for the country and area and at reasonable cost.

8. Most of these requests for a supply of posters cannot be met and at best the enquirer is referred to such bodies as the National Safety Council of the USA or the Royal Society for the Prevention of Accidents, UK, as possible suppliers.

9. But the posters provided by these and also by other sources in Europe and Asia are not at all suitable for use in the developing countries because (a) if they depict a human being he or she is very clearly of an ethnic and cultural group different from that of the developing country and the reaction is therefore that "the poster and its message is for the foreigner - it has nothing to do with us", in Indonesia or Bangladesh or wherever the poster happens to be on display, (b) any written message on the poster will be in English or French or German, etc., although a very few posters may be without an imprinted message, and (c) the paper on which the poster is printed is often not suited to the wide variations in humidity and temperature of many developing countries..

10. Generally speaking therefore it can be said that posters produced in the developed countries are not suitable for use in the developing countries.

11. If posters are produced in the developing countries by governments or voluntary bodies (for example, the National Safety First Council of Singapore produces about one poster a month) the great drawback is high cost. The number of posters that will be sold is limited and this alone puts up the cost per unit. Then the raw materials may also be costly, adding to the total cost. And so not many occupational safety posters are produced in the developing countries and yet there is a clear need for suitable posters in these countries.

12. This project is concerned with developing a special type of poster suitable for use in the developing world at a price that could be paid by governments, factories, companies and other establishments.

And it is proposed that each one of this special type of poster would be designed so as to be suitable for use in all or most of the developing countries of Asia.

13. Firstly, in this special type of poster any human figure would be replaced, being depicted by a cartoon figure to remove completely racial or ethnic characteristics. The facial features which identify racial groups, the dress, colour, etc., would all disappear. This would be achieved by using, for example;

- (a) anonymous animal-like figures such as are used in ILO population pamphlets,
- (b) matchstick type figures,
- (c) robot type figures,
- (d) other ideas developed by the artist.

It is proposed that an artist be employed to develop this special type of cartoon poster.

14. Secondly, as far as possible, posters without a human being appearing in the scene would be designed.

15. Thirdly, wherever possible posters which carry a clear "meaning without words" would be used, that is the illustration would so clearly present the message that no printed message need be included in the poster. However only some simple posters can be of this type. Most posters do require a printed message.

16. Fourthly, while the majority of the posters will require a message to convey fully the meaning, initially nothing will be printed on the poster. Instead a space of suitable size and position on the poster will be left blank. When these posters reach the developing country they can be "overprinted" with a message in the local language. The message would be a carefully selected translation based on the original wording required to complete the meaning of the poster. Generally the message would always, for simplicity, be printed on the posters in black or another standard colour.

17. Fifthly, the posters would be of a standard size suitable for Asia, be of robust material suitable to withstand wide variations of humidity and temperature. The dyes should not be liable to fade easily as well as being suitable for overprinting with printing inks available in the developing country.

18. Sixthly, the posters should make use of a limited number of colours but these should be bright ones.

19. Seventhly, the posters would be produced in bulk for the whole of the needs of the developing countries of Asia, and the printing should be carried out in a place where production costs are minimal (for example, Hong Kong or Holland).

Objectives.

20. To meet the need of the developing countries of Asia for a supply of Occupational Safety Posters.

21. The posters to be of cartoon style, any humans to be depicted as anonymous animal figures (as used in ILO's population booklets) or robot figures or as matchstick style figures or other designs free from ethnic characteristics.

22. The posters to be either designed without a printed message or to incorporate a suitable space in the design for overprinting of a message in the language of the developing country or area (or that of migrant workers) where they are to be displayed.

23. The posters to be made of a suitable material.
24. The cost of the posters to be kept to a minimum and payment to be made to the ILO in local currency.

Inputs.

25. It is proposed that Geneva seek out a suitable poster artist or artists who could draw these new poster designs. Such an artist could probably be found through an industrial art college or through industrial art studios which specialise in this type of work. The ILO public information or printing departments or sections could probably arrange this. The artists who produced the ILO population booklets might be approached.
26. The artists would be given a number of poster ideas suitable for the Asian countries. The Senior Occupational Safety and Health Officer, Bangkok, could select, say 24, suitable ideas using small illustrations of standard "developed country" type posters. The artist could work on these.
27. The selected artist(s) would work up initially, say 12, of these suitable ideas into this special type of poster.
28. Geneva would also obtain professional advice on the type of paper, printing, etc., to meet variations in humidity, temperature, etc., and would arrange all the other technical details.
29. A suitable printer would be found whose prices were reasonable. This printer could be in Europe or Asia.
30. Samples of the posters would be printed. These would be distributed in the developing countries of Asia to assess interest. The distributors might include Factory Inspectorates and Ministries of Labour, the outlets of the CIS and possibly also their information collecting centres, voluntary safety and health associations, other public bodies, large industrial companies, industrial associations, employers' organisations, workers' organisations and so on.

31. This might best be done through the ILO country offices with local assistance of the voluntary safety and health associations and others, and the ILO Office would select and arrange the overprinting. The ILO Office would arrange for a local printer to act as agent, receiving the posters from the central printers in Europe or Asia, overprinting and despatching them to all who wish to purchase them.

32. As these would be ILO posters payment could however be made to the ILO Office in local currency. This is particularly important as otherwise most potential purchasers would not be able to pay for them in any other currency.

Justification.

33. There is a very real need for suitable, reasonably priced, occupational safety posters for the developing countries of Asia. To meet this need would be a concrete step in furthering occupational safety. Private enterprise is unlikely for various reasons to find it an attractive proposition to produce such posters for several years to come - possibly longer. Probably the ILO alone is in a position to give the practical, effective help, required to provide the posters at this stage of development in Asia.

Immediate Action Proposed.

34. It is proposed that a pilot project be set up to try out this proposal aiming at - initially - the production of 12 posters.

Estimated Budget.

35. In the long run this project should pay for itself. To begin with it would have to be supported financially. It is difficult to cost this support from Bangkok and it is suggested that a costing be made in collaboration with the ILO printing section in Geneva.

DHB/ca

20.12.1976

THE ENGLISH OF OCCUPATIONAL SAFETY AND HEALTH
a proposal for a Regular Budget PIACT project.

Background.

1. Over the past decade or so, much attention has been paid to the use of the English language for special purposes; and a great deal of research has been carried out and a good number of books published and courses prepared on the subject.

2. This development arose from the realisation that the English language as used by scientists, and used in technology, as used in business and commerce and as used in other ways, differs quite markedly from the English language of literature and of general everyday use.

3. The meanings conveyed by some words, the structure of sentences and phrases, the phraseology, the forms of expression and above all the vocabulary of these special uses of English differ from the everyday use of English as well as from classical or literary English and indeed from one form of special English to another. As an example, business or commercial English differs markedly from that used by engineers or psychologists.

4. This use of English for special purposes became of increasing importance where English was a second or foreign language and therefore not so well understood as it would be if it was the speaker's mother tongue. It came to be recognised as desirable and helpful to teach the use of English for these special purposes to enable men and women, especially those for whom English was not their mother tongue, to learn to communicate more effectively and thus achieve greater understanding.

5. Amongst the English for Special Purposes publications are therefore found books and courses, some making use of tapes and records on such subjects as:

- (1) English in Physical Science.
- (2) English in Mechanical Engineering.
- (3) English at the Service of Agriculture.

- (4) English as a Foreign Language for Science Students.
- (5) The English that Doctors Speak.
- (6) Executive English.
- (7) Hotel English.
- (8) The English of Chemistry.
- (9) English in Workshop Practice.
- (10) A Programmed Course of Business English.

6. As an example of these, the content of No. (1) "English in Physical Science" by H.G. Widdowson and J.P.B. Allen Oxford University Press is summarised as follows:

"This course focusses on the means used to structure and convey information in scientific discourse. Eight units: the first seven follow the same plan: 1. a scientific passage into which learning/understanding checks are interpolated in multiple-choice form. The answers to these questions follow the passage along with a summary of the reasoning process by which the answers were reached. The next three exercises focus on contextual reference (anaphora, cataphora, etc.) rephrasing, and the way relationships between statements are expressed. Then come 2. exercises designed to lead the student from comprehension to productive written work. In the first, diagrammatically presented information must be expressed in words. The second concerns the writing of definitions. The next section poses problems which attempt to make the student integrate his linguistic and his scientific knowledge. The Grammar section concentrates on structure important to scientific discourse. In the paragraph-writing section the student is first required to order words to form sentences and then place those sentences in a logical order to produce a paragraph. The student next attempts to reproduce this paragraph, using only an outline provided in the textbook. The final section, Free Reading, contains a version of this paragraph but is intended mainly for independent study. Unit 8 contains a number of supplementary exercises which can be used with the first seven units."

7. Professor H.G. Widdowson is at the Institute of Education,
Malet Street, London.

Source: "English for Special Purposes - Information Guide No. 2"
The British Council,
English Teaching Information Centre,
10 Spring Gardens, London SW1A 2BN.

8. The aim behind the teaching of English for special purposes is to enable a person, be he an engineer, a scientist, a doctor or an economist, firstly to understand fully and accurately what is said or written by others of his own profession, and secondly to be able to use English both in the spoken and written form to convey meaning fully and accurately to others of his profession so that technical and scientific information can be exchanged and an accurate dialogue maintained on matters of professional common interest.

9. Now it has been observed that there is a clear need to raise the level of communications within the field of Occupational Safety and Health both in the spoken and in the written English word. A cursory study of reports, technical documents, papers presented at conferences and seminars reveals, all too often, a failure to convey meaning accurately and fully. And those who have listened to talks and discussion often have difficulty in being sure of the meaning which the speakers are trying to convey. Attached as an appendix are extracts which illustrate this point. Sometimes, but fortunately not often, communication breaks down almost completely, and one of the main causes of this poor level of communication arises from the fact that for all or almost all of those trying to communicate on these occasions the English language which they are using is a second or foreign language. Further the instruction they received in English was in all probability what we might call everyday English or may have included the English of simple literature. Rarely have they been instructed in the English of their profession, or that required for occupational safety and health.

10. It would be of very great assistance to communication in occupational safety and health if all who work within the field could have available to them an effective course of instruction in the use of the special English used for occupational safety and health.

11. This project proposal is therefore to initiate work in this field with the ultimate goal of producing a course of instruction in the special English of occupational safety and health, preferably in the form of a book published by the I.L.O.

Immediate Objectives.

12. To enable those who work or are concerned with occupational safety and health to achieve such a knowledge of the special English of the subject as to be able to understand and to use the English of occupational safety and health to communicate accurately and fully.

13. This involves a knowledge of the special meanings of words, of the construction of phrases and sentences, of phraseology, of forms of expression, of technical vocabulary as used in the technical and special English of occupational safety and health.

14. Some understanding of both British and American English may be involved.

15. Within the spoken word this is to be able to use and to understand English accurately and fully in conversation, technical discussion, talks, lectures and addresses on occupational safety and health.

16. And within the written word this is to enable private written communications, technical documents, reports, articles in journals and the publications of learned societies, papers and textbooks in occupational safety and health to be likewise accurately prepared and also to be read efficiently and fully comprehended.

17. Thus to enable a higher level of understanding during congresses, conferences, seminars, symposia, meetings, dealing with occupational safety and health, as well as in all forms of written communications, books, journals, technical documents, reports, etc.

Long-term/...

Long-term objectives.

18. To raise the overall level of communication in occupational safety and health amongst those who use English in Asia. This will in turn increase the effectiveness of occupational safety and health measures and research to the benefit of all concerned.

19. This would be one means of furthering the programme of Making Work More Human. The ILO programme refers repeatedly to the dissemination of information, not only dissemination but better means of dissemination, it refers to the value of publications, seminars, meetings, and the like. This proposed project will provide a tool to enable all of these to be of greater value.

20. Beside the above there may be some benefit to the working relationship between OS&H Experts and counterpart staff in Asian countries.

21. An important side effect could be that OS&H would become more widely known and appreciated through its association with a book dealing with an aspect of the English language. Some technical students and others might study the book for its special English language instruction and so learn more about OS&H at the same time. It could thus help to bring OS&H before a wider audience.

22. Note: There may be some thought along the lines that since much OS&H is made up of various sciences, engineering and other subjects the special purpose English courses developed for these subjects would help to cover OS&H needs. This is however only partly true. A good deal that goes into OS&H is not covered by other subjects or existing publications. Secondly, OS&H uses such subjects in its own way, making use of its own terminology, expressions and the like. There thus remains a need for a special purpose English course on OS&H.

23. And, a most important point is that none of the existing publications, even where some of the material is relevant to OS&H, treat or present the subject from the point of view of promoting OS&H. A separate publication on special purpose English for OS&H would, as pointed out above, thus be a valuable tool in helping to propagate OS&H.

24. The overall objective is thus to enable the OS&H specialist to communicate more fully, thus allowing a more fruitful, meaningful and accurate exchange of views and information at conferences, meetings, during conversations as well as by letter, through journals and scientific papers and also to be able to understand well textbooks on the subject. And this in turn will promote more effective OS&H activities everywhere, and help in the general aim of making work more human.

Proposed Inputs.

25. It is proposed that a feasibility study be carried out by a consultant such as Professor H.G. Widdowson, who would work out the best methods of approach to the subject and draw up an outline of the material to be incorporated in the course. He could also advise on who, or what group, would be best suited to carry out the preparation of the course.

26. The preparation of the course would become a more extensive project and would incorporate the publication of the course in book form by the ILO.

27. Professor H.G. Widdowson of the Institute of Education, Malet St., London, is proposed because (a) he is one of the foremost authorities in the field, (b) he carried out much of his earlier work in Asia, spending several years in Sri Lanka, Indonesia, in Dacca (Bangladesh) and he has promoted the use of special purpose English for technical use during training courses in the Regional English Language Centre, Singapore, and elsewhere in Asia, (c) about 18 months ago he expressed interest in the use of special purpose English in the field of occupational safety and health during a conversation with the author of this project.

28. The proposed project is for the English language as this is widely used at the technical level in Asia. Most conferences, seminars, meetings, etc., in OS&H in Asia use English as the medium of communication.

29. In addition the author of the project is aware of the extensive study that has gone into English for Special Purposes, the large amount of research work and the many publications on the subject.

30. There may be a comparable need for a similar project in other languages such as French, Spanish, etc., but the author is not competent to judge on this. Others should however be able to advise on this.

31. Date of Commencement of the Feasibility Project: As soon as possible.

32. Rough Estimated Budget of Feasibility Project.

	US\$
(1) one short-term consultant on a part-time basis for 3 m/w	3,750
(2) Supply, probably on loan, of books, journals, reports, etc. on OS&H for the use of the consultant.	950
(3) Travelling costs of the consultant in UK to attend sample OS&H meetings, visit specialists and have discussions.	900
(4) a two week visit of consultant to ILO Geneva to collect further background information and study ILO's OS&H material.	<u>900</u>
	<u>US\$6,500</u>

DHB/ca

20.12.1976

Appendix

As soon as fire breaks out in the factory, arrangements shall be made for extinguishing it on the one hand, and for throwing from the windows, doors and terraces such goods situated within the factory as can be saved from fire, on the other. But such goods shall be thrown with care. Such goods as have been thrown off shall be stored at a short distance where the fire cannot spread. Since the workers have to rush out of the factory immediately after the outbreak of fire, such transport arrangements shall be made for them as have been provided for in the act....

* * * * *

.... Many contests aiming at conditions of work and then, thus also at conditions of life, did not raise with modern world. They belong to human behaviour since men had to barter their physical or intellectual labour capabilities for any kind of salary paid by those-ones who ordered them; one should notice that disputes remained into limits of individual cases or narrow groups objections.

During the 19th Century's industrial revolution, the needs in manpower increased very quickly and caused denser concentrations of labourers. Because they were involved in the same ways and problems and into an environment they were not used to, the general figure was switched to collective objections and disputes....

.... With regard to inspection of nationalised plants and offices, one kind of administrative constraint could eventually occur if inspector is lower-graded than the head of department or factory he is inspecting. If so, means or ways should be looked after to avoid any uncomfortable situation or affect the follow-up of the statement (i.e. for instance setting up a special inspector's status excluding all professional reports or decisions and their effects from his personal administrative record in order not to matter with post, upgrading or career; another way although a little more administrative could consist in reporting directly to upper graded civil servant for decision by glos and comment on same document report for action record and filling with full copy for inspector's personal record.

Regarding/...

Regarding to health and confort in environment, some workers - even very big ones - must be extremely sweltering during monsoon season putting workers in a real furnace. Ways to improve those situations should be analysed with consideration upon efficiency and cost....

.... This to say that no standard prescription is ready for intake and curing, and more, that it will never be; so that any delay or postponment to state a problem in expectation of a later coming "patent medicine" is pure utopia and will only get the scope more complicated, the right way-out more difficult to reach and the implementation and improvement more heavy and slow to carry out and perhaps with less effect than expect....

* * * * *

.... There is an imperative necessity for a whole-time Museum Curator to help the Centre function better. This Curator is recommended to have an adequate training programme abroad in Museology. An Engineer was nominated in 1974 for a WHO fellowship in this connection but administrative problems have delayed his departure till 1976 and his programme curtailed to three months only. It is in the interests of efficiency if this or any other selected officer is permitted to take a training in Museum Technology for an academic year and his whole time services ensured for the Centre on his return. Further development in men and material for the Museum may await his mature recommendations on return....

* * * * *

.... Their efforts were resulted well in reduction of death cases by accidents down to 45 cases in 1974. These industrial accidents in the shipbuilding industry could be classified into the two categories in respect to their reasons; firstly the potential dangers and accidents should be taken into account at the phase of construction planning and designing and also on the occasions of changes and adjustments of such plans and designs, and secondly the other potential dangers may take place when safety check and maintenance of safety devices and equipment are inadequate and incomplete in view of the supervision of work. These two phases of engineering and administrative potentialities should be considered always for proper safety and health facilities and provisions....

These/...

.... These 43 cases occupy about half of the total surveyed. From this we feel it necessary to give much of safety education to those who are not yet familiar with the working environments, and/or those who became experienced after about five years' service longevity when they are just about to demonstrate themselves as the skilled journeymen....

* * * * *

THE SAFETY CONSULTANT'S GAME
a PIACT/RB project proposal.

Background

1. In recent years new forms of training for industry have been introduced and have proved valuable. Amongst these are the "In-basket" exercises for management training and also the "incident technique". These are designed primarily to provide practice in decision making, and they simulate business situations in a lecture room setting.

2. Within the field of Occupational Safety and Health training, new ideas have also been tried out and a most successful one is the "Safety Game" as devised by D. Petersen and presented in his book "Techniques of Safety Management" published by McGraw-Hill Book Company. The Safety Game appears in Appendix E, pages 213-242.

3. This Safety Game is designed to give the safety professional practice in making the kind of decisions he has to make during his everyday work as he goes about his normal duties. The game can be used individually, with or without supervision, or it can be used by a group.

4. The writer has had experience in using this game and he has been most impressed with its value in providing a certain kind of safety experience at a certain stage of the training of a safety officer or professional.

5. In this Safety Game the safety professional is called upon to play the part of consultant to a manufacturer. The game or exercise is divided into a number of sections. In each section the player studies some aspects of the company's operation and, as in real life, he does not always get all the information and cooperation he would like to have, some of the staff he speaks to are helpful, others not, some too busy to see him and so on. At the end of the section he has to prepare a report listing his recommendations and this report is then checked against the known correct recommendations. If his advice was sound the manufacturer's frequency and severity rates improve (i.e. the figures go down), if his advice was not correct the rates get worse.

6. The player then moves on to the next section and receives further information and has more interviews with company employees. He then submits another report. This is evaluated and the frequency and severity rates again reflect his skill. And so the game proceeds, section by section.

7. Attached as an Appendix is a copy of "The Safety Game", cut out from Mr. Petersen's book (as this version is copyright).

8. This concept and design of the Safety Game is of particular value in a number of ways. Firstly, it arouses keen interest in the player. As a player becomes more and more involved in the information provided as part of the game he becomes deeply interested in the problems presented during the game. He becomes very much involved.

9. Secondly, the game has a ring of reality about it. It presents circumstances as they are found in industry. Then the checking of the student's reports against the answers provides immediate feedback and reinforcement. If a group are using the game and they are allowed free discussion of each Section this can prove most stimulating and informative as each person throws in suggestions and ideas and everyone learns from this summation of thought. All in all the Safety Game is absorbing, instructional and the writer has not come across any safety professional who has played the Safety Game who has not said that he has benefited from its demands for decisions and action. The one criticism that is made is that it is too short, the players want it to go on longer.

10. When played in an Asian country however it is felt that some modifications are necessary. In particular the "loss-ratio" has little meaning in the developing countries and could well be dropped. The game would then concentrate on the frequency and severity rates. Also the introductory approach whereby the consultant - the safety professional - is going to be paid a fee based on a proportion of the loss-ratio figures is unnecessary (the game was presumably originally intended for use mainly in USA). Again this situation is much less likely to occur in Asia, so the column "cost" on the "critique" pages can be omitted.

11. Now modern approaches to Occupational Safety and Health under PIACT, etc., call for novel and new ideas, and these include methods of safety training. The use of the safety game approach fits well into this call for novel and new approaches.

Objective

12. This project proposal is to invite the author of the Safety Game, D. Petersen or someone he recommends, to produce another version of the Safety Game for use in safety training in the developing countries of the world, especially the Asian region. The game could be somewhat longer than his first one described above and might be modified in accordance with the suggestions made in para 10 above. It would also be designed for easy change of names to suit individual countries or areas. Other features of the developing countries would be allowed for in the content of the game. The game once produced, and paid for by ILO, would be made freely available for use by all. It could be published in booklet form by the ILO. In this way a small but useful modern teaching tool in the field of occupational safety and health would be made available at very modest cost, to all.

13. If Mr. Petersen is not available to carry out the work as an external collaborator or consultant, possibly he could, as suggested above, recommend someone else capable of preparing the game and carrying out the validation.

14. The original ILO Safety Game would be in English, but it would be well worthwhile considering translations into other languages (e.g. French, Spanish) for use in other parts of the world.

Estimated Budget

15. The cost would depend upon how much work is involved and this is not easy to assess without consultation with the prospective author to ascertain what would be involved.

16. Consideration might be given to printing the ILO booklet with the Safety Game in an eastern European country, making use of any accumulated currency of that area.

THE BRIEFING OF EXPERTS ON ASPECTS OF PIACT
a PIACT/RB project proposal

Background

1. "The International Programme for the Improvement of Working Conditions and Environment" (PIACT) as approved by the Governing Body in November 1976 includes under Appendix II. B para 35 of Operational Activities, the following statement:

"As regards conditions of work there will be above all, the introduction of elements relating to the improvement of conditions of work in various national and regional training projects under way (vocational training, management development training or workers' education) ..."

2. One way by which experts, especially those in the various fields of training referred to could be assisted and encouraged in this direction would be by providing them with appropriate textbooks; and to do so at the time of their briefing. While it is likely that the expert may be well equipped with his own technical books and manuals it is unlikely that he will possess books on occupational safety and health. This in turn means that his knowledge of this aspect of work may often be rather hazy and not very well formed. To introduce elements promoting OS&H and "Making Work More Human" (PIACT) we could therefore "begin at home" by promoting it amongst our own staff at the time of their briefing.

3. Following discussions with Vocational Training, Management Development and a Workers' Education in the Regional Office for Asia, it is proposed that as each new expert is briefed on taking up post in the Asian Region, he should be provided with one or more textbooks in the field of Occupational Safety and Health and the Environment. These would normally be handed over during a briefing session in the Regional Office, Bangkok, but where the expert is not brought to the R.O. the book or books would be sent to him.

4. The book or books supplied would be selected according to the field in which the expert is about to work. In addition consideration would be given to which book or books had been given to any other expert going to or in post at the same project.

5. When the book or books are handed over, preferably by the SOSHO or his associate-expert, a brief account of the PIACT programme would be given to this new expert explaining how Making Work More Human applied to his work. If possible, he would also be given some appropriate notes on the subject.

6. The expert would be asked to study the books supplied, make use of them in his work and to make them available to the other experts on the project. When he left the project at the end of his tour of service the book/s would be handed over for inclusion in the project's library.

7. The expert's own R.O. Unit would reinforce the importance of OS&H and the Making Work More Human programme during their briefing of the expert. It would be pointed out that as an expert, he had a special obligation and duty to uphold the aims, indeed the constitution of the ILO, and as this includes "the protection of the worker against sickness, disease and injury arising out of his employment" such an aim should be an ever-present consideration.

8. In addition the expert's unit would ask the expert to incorporate into his 6-monthly report details and comments on the action he had been able to take in this field during the period under review. This review of activities towards Making Work More Human on the project would thus become a modest but permanent feature incorporated into the routine reports and thus a constant reminder to the expert of ILO's policy and programme in this direction.

9. The actual selection of books would be made according to the nature of the project, the expert's work, his own background and other books supplied to the project's experts.

10. The books would be supplied from the following list (which may be added to as appropriate);

- (a) ACCIDENT PREVENTION MANUAL FOR INDUSTRIAL OPLRATIONS
N.S.C., CHICAGO.
- (b) FUNDAMENTALS OF INDUSTRIAL HYGIENE N.S.C., CHICAGO.
- (c) TECHNIQUES OF SAFETY MANAGEMENT
D. Petersen pub. McGraw-Hill
- (d) MAKING WORK MORE HUMAN -- THE DIRECTOR GENERAL'S REPORT
ILO
- (e) SAFETY TRAINING FOR THE SUPERVISOR
James E. Gardner pub. Addison-Wesley
- (f) OCCUPATIONAL SAFETY AND HEALTH IN RELATION TO PRODUCTIVITY
ILO, R.O. Bangkok
- (g) ACCIDENT PREVENTION - A WORKERS' EDUCATION MANUAL
ILO
- (h) ILO List of publications on OS&H
- (i) ACCIDENT PREVENTION MANUAL FOR TRAINING PROGRAMMES
M.E. Strong pub. American Technical Society.

11. A stock of these books would be held and the initial purchase would be of an estimated years needs.

Objectives

12. To introduce the "elements relating to the improvement of conditions of work in various national and regional training projects" in the Asian Region as outlined in the PIACT programme. And to do this by providing selected books for issue to experts when they are about to join their project. The books are listed under paragraph 10 and the appropriate book/s would be handed over to the expert during briefing.

ILO Inputs

- 13. Supply of books.
Duplicate notes prepared by Safety and Health
Extended briefing procedure.

Estimated Budget

- 14. 2 years supply of books US\$5,700.

TECHNICAL ARTICLES FOR THE JOURNALS OF CERTAIN LEARNED
AND PROFESSIONAL SOCIETIES
a RB/PIACT project proposal

Background.

1. In achieving a higher level of Occupational Safety and Health a key group is the professional men and women such as the mechanical, electrical, industrial, chemical and civil engineers, the physicists, chemists and other scientists, the doctors, architects and designers. The importance of these professionals is usually overlooked as it is commonly assumed, that the owners and managers of enterprises along with the legislators who formulate law relating to safety and health and the government inspectors who are charged with enforcing that law are the persons who are of prime importance in establishing the levels of safety and healthiness of the place of work. These latter groups are indeed important. But there is a need to recognise the vital role played by the professionals and, having recognised this, to develop means of influencing and encouraging them to work for higher standards of occupational safety and health in all places of work.

2. The professional plays a vital role because it is he who decides what will be the technical standards to which plant, machinery and equipment will be designed, constructed, operated and maintained. It is rarely the owner or the manager, unless he also belongs to one of the professional groups listed, who makes such decisions. A manager is more likely to be a business man, an accountant, or sometimes an economist. When it comes to deciding the vital layout of the plant and machinery, the constructional details of that plant and machinery, and the degree of its safeguarding, the electrical installation and other services such as the lighting, ventilation, including the amount of exhaust ventilation to be installed, heating or cooling, the level of air contaminants to be tolerated, radiations, noise and vibration as well as the level of process hazards, etc., the vital decisions on all these matters are made by the

professionals/...

professionals. For example, the architect, designers and civil engineers will very largely decide the structure of the building, etc., using in part professional standards supplemented to a large extent by their own knowledge and judgement. The mechanical and electrical engineers will select machines and equipment of which they personally approve and will install them to the standards they consider necessary. These standards will again be in part those of the appropriate professional Institute of that country along with a good deal of personal judgement exercised by the professional. Similarly the standards of operation and, in particular, the level of maintenance, which plays such an important part in the operational safety of plant, will very largely be settled by decisions made by these professionals.

3. Where non-professional management puts pressure on the professionals to lower standards in order to cut costs the professional is in quite a strong position if he wishes to oppose any serious cuts, because management is dependent on his technical advice and finds it difficult to dispute technical matters. If an engineer states that a pressure vessel must be designed to withstand a certain pressure it is difficult for a manager who is an accountant or a businessman to successfully argue against this. In the end it is by and large what the professional says that is accepted.

4. Now while a fair proportion of the technical standards used by the professionals will come from Rules or Regulations issued by the professional Institute, either in their own country or in other countries, much will still be left to the judgement and experience of the professional himself. Even where the standards come from Rules or Regulations of an Institution it should be borne in mind that these are usually drawn up by select committees of the members of the Institute itself, so a great deal comes back to the individual judgement of the professional.

5. The level of safety and health standards applied by the professionals will depend upon a number of factors, but two of these will be critical. The first is the professional's own knowledge and how up-to-date it is and the second is the importance which he attaches to safety and health matters. This last consideration will largely depend upon to what extent he is motivated to promote a good standard of safety and health.

As an example, the writer recalls, that a new chief electrical engineer of a very large organisation went to a great deal of trouble to raise very considerably the level of electrical safety within the 110 plants which formed that organisation, doing so over about 5 or 6 years. He transformed conditions, as far as electrical safety was concerned, with management giving way to his professional knowledge and technical arguments in favour of higher safety standards. His motivation arose from one event - his brother had been crushed to death in an industrial accident.

6. When a professional is being trained at university or elsewhere safety standards are included as part of his training. On the completion of his training this stops. However there is one important way by which most professionals attempt to keep up to date. That is through membership of their appropriate professional organisation, such as an Institute of Electrical Engineers. Most of these professional Institutes publish a Journal or Proceedings which include lectures given to the society, new research findings and other technical matters, and most professionals pay a great deal of attention to the journal of their own society. Most of them studying it carefully to keep up to date with new developments, and it will usually be found, often in bound copies, on a bookshelf in their office.

7. The thesis of this proposal is that these professional men and women are key persons in setting and maintaining the safety and healthiness of places of work, and that we should (1) endeavour to assist them in keeping up to date with new safety and health standards, and (2) encourage them to apply fully the recognised standards endeavouring to influence them and to motivate them to do so.

8. This can be done to some extent during their professional training at university or elsewhere and it is understood that measures are in hand to improve the safety and health content of such teaching. The motivational effects are likely to be minimal however as safety does not appeal to the younger person to the same extent as it does to the middle-aged, older and more experienced person. It is they who bring the greatest pressure to

bear/...

bear in the field of safety and health. Now it is these senior professionals who are usually in positions of influence within their companies and who act as consultants. It is also those very same senior professionals who tend to guide the professional Institutes, sitting on select committees, etc. The point of influence is therefore the Learned and Professional Societies or Institutes and, in particular, their Journals, Proceedings and other publications.

9. If the message of safety and health can be presented through these journals we reach the key persons - the professionals - by a most convenient route.

10. The professional journals usually maintain a high standard of contribution and any contributions on safety and health must be of a comparable high standard. Such contributions must be written by professionals within that discipline, a mechanical engineer for the journal of a society of mechanical engineers, a chemist for a chemical journal and so on.

11. The articles could probably fall into several classes; (a) those which introduce new safety and health standards and explain their purpose and give detailed specifications, (b) review type articles which refresh the memory and help reinforce acceptance of existing standards, for example, those of the country or if these do not exist the standards recommended by ILO, (c) descriptions of recent accidents and dangerous occurrences from which technical safety and health lessons can be learnt, (d) and as far as possible motivational articles, possibly based on statistics which have become available of injuries, damage and losses.

12. It is therefore proposed that we should (a) make note of the main professional societies in Asia in the various branches of engineering, chemistry, physics medicine, architecture, etc., as well as the main societies in other countries to which Asian professionals belong and (n) through the use, on a long term basis, of external collaborators have "occasional articles" prepared and printed in the journals of these various learned societies. By these means we would be presenting safety and health to the key persons, the professionals, who can do so much to set,

maintain/...

maintain and improve the safety and health standards in places of work.

13. Initially it is proposed that the project would be confined to English language journals. Later it might be extended.

14. The PIACT programme makes mention of the need to reach the key persons of influence. This proposal suggests one means.

Objectives.

15. To improve standards of occupational safety and health through the professional men and women such as mechanical, electrical, chemical, industrial and civil engineers, physicists, chemists, doctors, architects and designers. These professionals would be reached through their Learned and Professional Societies and Institutes and, in particular, through the Journals, Proceedings and similar publications of the Institute. Occasional articles dealing with occupational safety and health matters, written at the same high level of competence as the other articles in these journals would be published by professions of the appropriate disciplines, e.g. a doctor writing in an industrial medical journal, a mechanical engineer in a journal of an institute of mechanical engineers. ILO Collaborators would be selected from amongst appropriate professionals and these would be the doctors, engineers, scientists, etc., who would prepare "occasional articles" for publication in these journals. The same collaborator, might be able to prepare articles for journals e.g. on mechanical engineering, published by the institutes of mechanical engineering in different countries.

Inputs.

16. (a) through the ILO library facilities in Geneva and Bangkok and country offices in Asia prepare a list of the main learned and professional societies within the disciplines listed (using English language as their medium) which are most widely used by professionals in Asia,

(b) ascertain which publish journals, etc., and obtain details and specimens of these journals,

(c) select and approach senior members of professional bodies or societies, possibly university staff or others, choosing those known to be sympathetic to the needs of safety and health,

(d)/...

(d) engage them as external collaborators to prepare "occasional learned articles" in their own professional field on some aspect of safety and health of the type listed above under para 11,

(e) collect material and supply it to these external collaborators, through Geneva Headquarters, making use of the CIS system; through the professional societies of the developed countries; and through reports such as those of the CIF's in the developed countries,

(f) the external collaborators could use this material as a basis for their articles, along with material collected from within their own country,

(g) these external collaborators should be automatically provided with all new ILO publications in the field, and receive other reference books which may not be readily available in their own country, (very important where currency restrictions apply),

(h) these collaborators should be offered training or training material on the writing and preparation of technical articles for Journals,

(i) payment to the collaborators could be, if requested, in the form of books and other publications instead of money,

(j) these external collaborators would be encouraged whenever convenient to attend high level conferences, seminars and meetings in the area e.g. UNIDO meetings on their subjects. If they present a paper at them the aim would be to have it reproduced in their society journal so that it reached the wider audience.

Estimated Budget.

17. Initially it is proposed that the aim should be to gradually build up publication to a level of about 300 articles per year in the English language journals of the learned and professional institutes of which the professionals of Asia are members. This is based on the assumption of 2 articles per year in say 10 journals. But more accurate figures should become available after the action proposed under para 16 (a) and (b) had been taken.

This project would take some time to develop. Its estimated cost for the first 2 years of full operation might be in the region of US\$25,000, most of this being payments to external collaborators.

TEACHING MATERIALS - SAFETY MODELS AND ILLUSTRATIONS

a proposal for a Regular Budget project*

1. Government officials and other visitors following safety and health fellowships and visits to the developed countries have often spoken highly of the teaching value of safety and health "centres", "exhibitions", "museums", etc. In these places safety and health teaching materials, devices and equipment are shown, sometimes as models, often as full working models and good quality photographic enlargements are also displayed.
2. These visitors have often urged that similar centres be set up in the developing countries to teach the recognition of hazards and explain safety precautions including the design and operation of mechanical guards. It is felt that in the developing countries such displays are of particular value in teaching employers and workers alike to recognise hazards and dangers and the appropriate measures to be taken in dealing with them.
3. In one or two of the developing countries safety centres of this nature have already been set up. A fine example of these is to be found in the Central Labour Institute, Bombay, where a wide presentation of safety, health and environmental exhibits provide the visitor with a great deal of useful information. In addition to the static centre, mobile exhibitions in the form of specially designed vehicles are also used.
4. Some other countries, for example, Sri Lanka and Hong Kong, have small static or fixed exhibition centres, while others are asking for them and have been seeking aid funds to help provide such centres.

5/...

* The Resolution concerning Future Action of the International Labour Organisation in the Field of Working Conditions and Environment, adopted on 24 June 1975 under 4(e) calls for, the preparation of teaching materials and more detail is given in paras 33, 34, and 35 of Appendix II of the PIACT programme approved by the Governing Body in November 1976.

5. The equipping of such centres in this traditional fashion can be very expensive and as an example one such aid request amounted to over half a million US\$ for a very limited number of machines and their guards, etc. Costs of this order are prohibitive and such projects are rarely supported.

6. Yet there is a great need to illustrate the dangerous parts of machinery and demonstrate the standard methods of guarding them in a way readily understood in developing countries.

7. This project proposal is to make it possible to meet this need at very reasonable cost by providing firstly a set of standard photographic illustrations and secondly a set of standard models which could be readily manufactured and supplied to the developing areas of the world. The project is concerned with the design of the prototypes, the preparation of standard drawings and details for the commercial production of the models.

8. Firstly, then it is proposed that a standard set of photographic enlargements, each approximately 18" x 12" and preferably in the form of colour transparencies suitable for back illumination and wall or panel mounting be prepared, to illustrate the Dangerous Parts of Machinery.

9. It is proposed that the reduced version of 17 classes of dangerous parts be used, one illustration only for each class of dangerous parts being shown. However the total list of dangerous parts covered by the class would be described in English or a space left for this to be added in an appropriate language (or languages, in a country where the working force may speak several languages)

10. The 17 classes are as follows:

- (1) Revolving shafts, couplings, spindles, mandrels and bars,
e.g. line and counter shafts; machine shafts; drill spindles; chucks and drills, etc.; boring bars; stock bars; traverse shafts.

(2)/...

- (2) In-running nips between pairs of rotating parts, e.g. gear wheels; friction wheels; calender bowls; mangle rolls; metal manufacturing rolls; rubber washing, breaking and mixing rolls; dough brakes; printing machines, paper making machines.
- (3) In-running nips of the belt and pulley type, e.g. belts and pulleys, plain, flanged or grooved; chain and sprocket gears; conveyor belts and pulleys; metal coiling and the like.
- (4) Projections on revolving parts, e.g. key-heads; set screws; cotter pins; coupling bolts.
- (5) Discontinuous rotating parts, e.g. open arm pulleys; fan blades; spoked gear wheels, and spoked flywheels.
- (6) Revolving beaters, spiked cylinders, and revolving drums, e.g. scutchers; rag-flock teasers; cotton openers; carding engines; laundry washing machines.
- (7) Revolving mixer arms in casings, e.g. dough mixers; rubber solution mixers.
- (8) Revolving worms and spirals in casings, e.g. meat mincers; rubber extruders; spiral conveyors.
- (9) Revolving high-speed cages in casings, e.g. hydro-extractors; centrifuges.
- (10) Abrasive wheels, e.g. manufactured wheels; natural sand stones.
- (11) Revolving cutting tools, e.g. circular saws; milling cutters; circular shears; wood slicers; routers; chaff cutters; woodworking machines, e.g. spindle moulders, planning machines and tenoning machines.
- (12) Reciprocating tools and dies, e.g. power presses, drop stamps; relief stamps; hydraulic and pneumatic presses; bending presses; hand presses; revolution presses.
- (13) Reciprocating knives and saws, e.g. guillotines for metal, rubber and paper; trimmers; corner cutters; perforators.
- (14) Closing nips between platen motions, e.g. letterpress platen printing machines; paper and cardboard platen machine cutters; some power presses; foundry moulding machines.

- (15) Projecting belt fasteners and fast running belts, e.g. bolt and nut fasteners; wire pin fasteners and the like; woodworking machinery belts, centrifuge belts; textile machinery side belting.
- (16) Nips between connecting rods or links, and rotating wheels, cranks or discs, e.g. side motions of certain flat-bed printing machines; jacquard motions on looms.
- (17) Traps arising from the traversing carriages of self-acting machines, e.g. metal planing machines.

11. A photographic display of this type is to be found in the Safety and Health Centre, Horseferry Road, London, and Safety and Health visitors and fellows often speak highly of it. However, it is more suited to a developed country than developing ones and what is desired under this project is a photographic display fully suited for use in the developing countries of Asia (and elsewhere).

12. The exact form, construction, layout, etc., would all be left to the discretion and judgement of the Expert to be engaged to act as the designer of the exhibition display.

13. Secondly, it is proposed that a set of working models be designed and produced. These would be in size scaled down models of standard machines, made of suitable material and of robust construction. As far as outward appearance is concerned they would resemble real machines but would only operate in so far as was necessary to demonstrate the use of the guarding device. Each of the model machines in the set would be fitted to demonstrate one of the standard methods of guarding, etc., and would be a full working model as far as the illustration of the method of guarding was concerned. They could be powered by small electric motors.

14. These models would be about one-quarter to one-eighth actual size, and the standard methods of guarding to be incorporated into these working, scaled down models would include;

- Fixed guards
- Adjustable fixed guards
- Interlock guards

Automatic/...

Automatic or sweep away guards

Trip guards

Distance guarding and other guarding devices.

15. The machine models chosen could possibly include a circular saw, overhead planing machine, slow moving power press, quick moving power press, rubber rolls (or similar machines) with trip or sensitive bar, a guillotine with photo-electric cells, an overhead drilling machine and others suited to illustrate the standard method of guarding and selected from machines which readily lend themselves to reproduction as models.

16. Some of these machines would be similar to the models used in the CLI Bombay Exhibition Centre but larger than the very small models used on the CLI mobile exhibition.

17. Again the exact form, construction, layout, etc., would be left to the discretion and judgement of the Expert who acts as the designer.

18. The Expert would carry out the developmental work, produce prototype models, make detailed engineering drawings of these and provide all the information so that a manufacturer (or even a centre such as the CLI Bombay) could, as required, manufacture the models. Being only models on which the guarding worked, their cost would be a small fraction of the full machine on which they are based.

19. This would make available for supply to the developing countries the two basic requirements;

(a) a good quality set of approximately 17 large colour transparencies illustrating the dangerous parts of machines;

(b) Scale models of machines demonstrating the standard methods of guarding the dangerous parts machines.

These would be available at a reasonable cost and could be used in various ways.

20. In some cases a developing country might wish to purchase, with its own funds, a set of these illustration of the dangerous parts of machines and of the models of the methods of guarding and use them as the basic display at a safety centre.

21. In other cases, the supply of these could be included in an Occupational Safety and Health project (funded by UNDP, multi-bilateral or other aid).

22. In yet other cases, projects such as Training projects, or Management Development projects, might include these in the equipment to be supplied so that they could become a part of the instructional material used on the project.

Objectives.

23. To make it possible to provide, at reasonable cost to the developing countries for use in safety exhibition centres and on training projects, illustrations of the dangerous parts of machines and working models of the standard methods of guarding of these dangerous parts.

24. To do this, full engineering drawings and all the other information required to allow such models to be built at any time by a manufacturer would be required. The standard illustrations would also have to be developed.

Inputs

25. An Expert who should be an engineer designer/artist experienced in carrying out the work described above.*

26. The development, in a suitable workshop, of the illustrations and models.

27/...

* Mr. Madan Mohan who has worked in the past as an ILO Safety and Health Expert might be suitable. He has produced some models and illustrations used at the Central Labour Institute, Bombay, and is quite skilled in this work. He combines the skill of an engineer, a designer and an artist; a combination normally difficult to find.

27. Travel costs for the Expert to collect suitable photographs, etc. This might include a visit to UK to the Horseferry Road Centre, London and elsewhere.

Rough Estimated Budget.

		US\$	
28.	One Expert for 12 m/m	3,750 x 12	45,000
	Development costs in workshop, material, preparation of prototypes, etc.	up to	47,500
	Travel		5,500
	Total up to		<u>US\$98,000</u>

DHB/ca

20.12.1976

SAFETY MANUAL FOR BANGLADESH

(as requested during the Dacca Seminar on "Making Work More Human".)

A R.B. project proposal.*

1. During the ILO Seminar "Making Work More Human" held in Dacca, Bangladesh from 13 - 15 December 1976 several participants spoke of the need for a booklet or small manual on the subject of Occupational Safety to be distributed widely in the Republic. The booklet should be in the language of Bangladesh, that is Bangla, and should preferably include some simple illustrations interspersed in the text.
2. The participants who asked for this booklet came from both the employers' and workers' participants and were supported by the government participants. One participant referred in particular to illustrated booklets on the subject of industrial safety which he had seen in Singapore and he added that he believed "Mr. Brown had a hand" in helping to produce the Singapore booklet and he enquired "if Mr. Brown could possibly help" in preparing a booklet for Bangladesh.
3. In order to meet this pressing need and to do so at the minimum of cost while at the same time providing a publication which would be of value to all organisations whether teaching institutions, workers' or employers' organisations, as well as for distribution by the government the following is proposed.
4. The booklet would be based on the well known ILO's "Accident Prevention - a workers' education manual".
5. The SOS&HO at the R.O. Bangkok (Mr. Brown) would modify and adjust where necessary the content and presentation of the booklet to make it better suited to the needs of Bangladesh.

6/...

* This project is very much in line with the PIACT approach.

Inputs.

15. The R.O. Bangkok would provide the modified version of the manual.
16. The ILO Dacca would arrange the translation into Bangla, the minor modifications necessary to any of the manual drawings checking the translation from the technical point of view by the Chief Inspector of Factories and Establishments, Bangladesh and the printing.
17. The ILO Office Dacca would also launch publication at a brief ceremony in the presence of the press. They would then carry out the general distribution, allowing this to be spread over 12 months.
18. The ILO Office Dacca would also carry out the follow-up enquiry approximately 6 months after the main distribution.

Government Assistance.

19. No financial assistance is envisaged.*
20. Starting Date.
As soon as possible.

Estimated Budget.

21. Translation into Bangla, art work, and printing of approximately 10,000 copies.
Financial estimates to be obtained by ILO Office Dacca.

* As there would be no government financial commitment involved presumably no formal clearance by the government of this small project would be required, but it would be of course desirable to have a verbal agreement from the Chief Inspector of Factories Bangladesh.

15 Novembre 1976

Monsieur G. Spyropoulos
Département des conditions de
travail et de vie - B.I.T.
CH 1211 GENEVE 22

Cher Monsieur,

Je vous remercie de votre lettre du 11 Novembre et du dossier qui y était joint. J'ai beaucoup apprécié les textes récemment produits, en particulier les propositions pour le programme 1978/79, le texte sur l'enquête générale et les fiches programme. Je suis persuadé que tout cela donnera lieu à des réalisations du plus haut intérêt.

L'ordre du jour de la réunion me paraît excellent. Je serai en mesure de tenir mon engagement en ce qui concerne le point 4 du mardi 23. Un petit rapport de propositions a été rédigé sur mon voyage en Indonésie et aux Philippines. Il est à la frappe et j'espère vous l'envoyer à la fin de la semaine. J'en apporterai en tout cas une dizaine d'exemplaires pour la réunion des 23 et 24.

J'ai l'intention d'arriver dès lundi soir à 22^h40 (SR 731) pour éviter un retard éventuel dû au brouillard. Je serais heureux si votre secrétaire pouvait me retenir, dans le quartier de la gare Cornavin, une chambre pour 1 personne avec douche, sans bains (entre 50 et 70 F.S.) pour les nuits du 22/23 et 23/24 Novembre.

Je dois déjeuner le 23 avec Monsieur Fortin et dîner ce même jour avec Mademoiselle le Professeur Rey et les dirigeants du Centre Associé du CNAM à Femney-Voltaire.

Veillez agréer, cher Monsieur, l'expression de mes sentiments dévoués.

A. Wisner

8 Novembre 1976

Monsieur Bernard Fortin
Directeur du Cabinet
Direction Générale du B.I.T.
CH 1211 GENEVE 22 (Suisse)

Cher ami,

Je vous remercie de votre accueil au téléphone, toujours si amical, et vous confirme le plaisir que j'ai à déjeuner avec vous le 23 Novembre.

Je vous fais parvenir, ci-joint, une copie de la correspondance que j'ai échangée avec Monsieur Spyropoulos, car elle peut être un élément de notre réflexion.

Veillez agréer, cher ami, l'expression de mes sentiments dévoués.

A. Wisner

*Confirmer telex
8.10.76*

22 Octobre 1976

Monsieur G. Spyropoulos
Chef du Service des conditions de
travail et de vie
B I T
CH 1211 GENEVE 22

Cher Monsieur,

Je vous confirme ma présence à Genève les 23 et 24 Novembre prochain. Je me réjouis véritablement de cette rencontre, d'autant plus que vous aurez pu évaluer déjà, en Amérique Latine, les différents aspects du projet que vous dirigez.

J'essaierai moi-même de rédiger les quelques pages de projets pour l'Indonésie et les Philippines, que j'aurais dû vous remettre plus tôt.

Veillez agréer, cher Monsieur, l'expression de mes sentiments dévoués.

A. Wisner



INTERNATIONAL LABOUR OFFICE
BUREAU INTERNATIONAL DU TRAVAIL
OFICINA INTERNACIONAL DEL TRABAJO

Adresse postale CH-1211 GENÈVE 22
Télégrammes INTERLAB GENÈVE
Télex 22.271
Téléphone 98 52 11

Réf. BIT/ILO n° PIACT 2-63

Votre réf. n°

Monsieur A. Wisner,
Conservatoire National
des Arts et Métiers,
Département des Sciences
de l'Homme au Travail,
41 rue Gay-Lussac,
75005 PARIS

(France)

20 OCT. 1976

Cher Monsieur,

J'ai pris connaissance de votre lettre du 4 octobre 1976, à mon retour de mission en Amérique latine et vous en remercie.

Je propose que l'on retienne les dates des 23 et 24 novembre pour votre voyage à Genève. Je préparerai et vous enverrai, avant votre départ, des suggestions concernant le programme de travail pour ces deux journées. Je préparerai également et vous ferai parvenir, avant votre départ pour Genève, un contrat de collaboration extérieure.

Dans l'attente du plaisir de vous revoir, je vous prie d'agréer, cher Monsieur, l'expression de mes sentiments très cordiaux.

G. Spyropoulos,
Chef du
Service des conditions de travail
et de vie,
Département des conditions et
du milieu de travail.

4 Octobre 1976

Monsieur G. Spyropoulos
Chef du Service des Conditions
de travail et de vie
B. I. T.
CH 1211 GENEVE 22

Cher Monsieur,

Je vous remercie de votre compréhension vis-à-vis des positions que j'exprime dans ma lettre du 17 Septembre.

En ce qui concerne notre rendez-vous de Novembre, je n'avais retenu ces dates que parce qu'elles figuraient dans vos propositions initiales, mais je sais par expérience combien nos carnets de rendez-vous peuvent être modifiés par de nouvelles nécessités.

Je suis tout à fait d'accord pour venir à Genève du 22 au 26 Novembre; toutefois, j'enseigne le 22 et le 26, aussi vous demanderai-je de choisir soit le 23 et le 24, soit le 24 et le 25.

Je vous exprime à nouveau ma satisfaction de collaborer avec vous-même et votre Service, et vous prie d'agréer, cher Monsieur, l'expression de mes sentiments dévoués.

A. Wisner



INTERNATIONAL LABOUR OFFICE
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PIACT 2-63
Réf. BIT/ILO n° PIACT 1-0-01
CL 28-101
Votre réf. n°

Professeur A. Wisner,
Conservatoire national
des Arts et Métiers,
Département des Sciences
de l'Homme au Travail,
41 rue Gay-Lussac,
75005 PARIS
(France)

Cher Monsieur,

1 OCT. 1976

Je viens de recevoir votre lettre du 17 septembre 1976 et vous en remercie.

Je suis désolé qu'il ne vous soit pas possible de participer à la mission multi-disciplinaire que le BIT envisage d'envoyer au Venezuela, mais je comprends parfaitement les raisons qui ont motivé votre refus.

En ce qui concerne le colloque que nous organisons en mai prochain sur l'aménagement du temps de travail et les problèmes sociaux relatifs au travail par équipes, je suis également d'accord avec vous que M. Carpentier serait qualifié pour participer à cette réunion. En fait, nous avons déjà envisagé, en consultation avec l'intéressé, de l'associer à cette réunion, non pas comme expert indépendant, mais comme consultant qui viendrait renforcer le secrétariat que le Bureau mettra à la disposition du colloque.

Je vous remercie de l'envoi des deux notes : celle sur les "instituts sans mur" et votre communication au sixième Congrès de l'Association Internationale d'Ergonomie. J'étais déjà en possession de ces deux documents dont d'ailleurs, nous nous sommes inspirés lors de la préparation et de la mise au point du PIACT et des propositions de programme et de budget pour 1978-79. L'analyse contenue dans votre communication me paraît excellente et je souhaiterais que l'on puisse voir ensemble comment une conception comme la vôtre pourrait être traduite en termes d'action internationale.

mea comprehension

- date prepau conf... à lettre autum

*- 2 jours 23-24 au 24-25 car cum de 22
ET cum de 22
0 26*

Ce point ainsi que beaucoup d'autres points concernant le lancement du PIACT pourront être abordés lors des entretiens que nous aurons avec vous en novembre prochain. Les dates des 10 et 11 novembre que vous proposez ne nous conviennent malheureusement pas; en effet, c'est dans le courant de la semaine se terminant le 12 novembre et au début de la semaine suivante que le Conseil d'administration du BIT procédera à une discussion approfondie du PIACT, ce qui signifie que, aussi bien M. de Givry que moi-même et nos autres collègues dans le Département serons retenus par cette discussion. Je vous propose par conséquent que l'on fixe deux jours, à votre convenance, dans la semaine du 22 au 26 novembre, étant donné que la première semaine du mois de novembre sera consacrée à des discussions avec les membres de la mission multi-disciplinaire qui se rendra au Venezuela du 8 au 30 novembre (les dates de cette mission viennent d'être avancées à la demande des autorités vénézuéliennes).

Dans l'attente de votre réponse, je vous prie de croire, cher Monsieur, à l'expression de mes sentiments très cordiaux.



G. Spyropoulos,
Chef du
Service des conditions de travail
et de vie,
Département des conditions et
du milieu de travail.

88. En raison de l'éparpillement des petites entreprises, c'est par l'intermédiaire des associations professionnelles ou d'organismes interentreprises - par exemple des services de médecine du travail et de sécurité et d'hygiène du travail - que ces efforts d'amélioration ont été entrepris. Il est proposé de faire une étude des meilleurs moyens utilisés par ces associations ou organismes interentreprises dans certains pays pour améliorer les conditions de travail et la sécurité et l'hygiène dans les petites entreprises. Souvent ces associations s'adressent à des centres de productivité pour obtenir une aide technique dans le domaine de la gestion; il est essentiel de veiller à ce que ces centres consacrent une partie de leurs efforts aux problèmes de conditions et du milieu de travail et aux mesures propres à les améliorer¹.

I. Activités concernant des catégories particulières de travailleurs

89. Si l'on veut cerner concrètement les problèmes de conditions et de milieu de travail, il importe qu'ils ne soient pas seulement étudiés sur une base générale ou dans le cadre d'une région ou d'un secteur déterminé de l'économie, mais aussi en relation avec les besoins spécifiques de catégories particulières de la population travailleuse.

90. En ce qui concerne les travailleuses, l'amélioration de leurs conditions de travail devra être recherchée dans le cadre de la politique tracée par la Déclaration concernant l'égalité de chances et de traitement pour les travailleuses et des deux résolutions² qui l'accompagnent, adoptées par la Conférence à sa session de 1975.

91. De même, la promotion des normes internationales du travail concernant les travailleurs migrants - et spécialement la convention et la recommandation adoptées en 1975 - guideront l'action relative aux travailleurs étrangers et migrants, de manière qu'ils bénéficient de l'égalité de chances et de traitement en matière de conditions et de milieu de travail comme dans les autres domaines.

92. On veillera à ce que, dans le cadre du PIACT, des activités spécifiques soient aussi consacrées aux conditions de travail des jeunes travailleurs, des travailleurs âgés et des travailleurs handicapés.

J. Collaboration avec d'autres organisations intergouvernementales

93. La plupart des réponses reçues des diverses organisations gouvernementales mentionnées au paragraphe 11 ci-dessus manifestent un grand intérêt pour la résolution adoptée par la Conférence à sa session de 1975 et affirment leur volonté d'assurer à l'OIT leur pleine collaboration à cet égard. Celles reçues de la FAO, de l'OMS et de l'ONUDI sont particulièrement détaillées dans les informations qu'elles donnent sur les activités entreprises par ces organisations qui pourraient faire l'objet d'une action conjointe ou reliée au PIACT. De leur côté, plusieurs gouvernements ont insisté dans leurs réponses sur le rôle de coordination qui devrait revenir à l'OIT en ce qui concerne les activités des diverses organisations internationales relatives au milieu de travail.

¹ Voir également la "Résolution concernant la contribution des petites et moyennes entreprises au progrès économique et social et à la création d'emplois, en particulier dans les pays en voie de développement" adoptée par la Conférence internationale du Travail à sa 60e session (1975).

² Résolution concernant un plan d'action en vue de promouvoir l'égalité de chances et de traitement pour les travailleuses et Résolution concernant l'égalité de statut et l'égalité de chances pour les femmes et les hommes en matière d'emploi et de profession.

94. Une mention spéciale doit être faite du Programme des Nations Unies pour l'environnement étant donné que le paragraphe 4, 3) du dispositif de la résolution de la Conférence invitait le Conseil d'administration à charger le Directeur général "d'entreprendre, avec la collaboration et l'appui du Programme des Nations Unies pour l'environnement, un programme cohérent de l'Organisation internationale du Travail concernant l'environnement". A sa 198e session (novembre 1975), la Commission des organisations internationales du Conseil d'administration a été saisie d'un document détaillé sur cette question¹, et le Conseil d'administration a donné des directives² quant aux lignes directrices qui devraient guider l'élaboration de ce programme.

95. Une mission de programmation conjointe PNUE/OIT doit avoir lieu à la fin du mois de mai 1976. En plus "des activités en matière d'enseignement et de formation concernant l'environnement" - sur lesquelles la résolution mettait spécifiquement l'accent - que l'OIT pourrait entreprendre dans le cadre de ses divers programmes de formation, il est prévu que l'amélioration des conditions et du milieu de travail, considérée comme un éco-système particulier, sera l'élément essentiel des discussions avec le PNUE, car c'est dans ce domaine que la collaboration entre l'OIT et le PNUE peut être particulièrement fructueuse. Cette coopération s'étendra à certains aspects des établissements humains, le milieu de travail étant l'une des composantes de ceux-ci, et à certains aspects du développement et de l'environnement, étant donné les "conséquences économiques et sociales des politiques de l'environnement", autre aspect mentionné dans la résolution de la Conférence.

96. Ainsi le programme d'action de l'OIT en matière d'environnement, qui représente la contribution spécifique de l'OIT au Programme des Nations Unies pour l'environnement et qui doit être entrepris avec la collaboration et l'appui du PNUE, apparaît comme une extension du PIACT qui le relie aux domaines plus larges des établissements humains, de l'environnement et du développement. Par ailleurs, ce programme peut représenter l'une des voies par lesquelles les conditions et le milieu de travail peuvent être incorporés à la gestion de l'environnement et à la planification du développement. Il est de nature à favoriser la coopération, non seulement avec le PNUE, mais aussi avec d'autres organisations internationales.

¹ Document GB.198/IO/6/7.

² Documents GB.198/15/26 et GB.198/IO/6/7.

9 Avril

Monsieur Kane
ILO Liaison Office
345 East 46th Street
NEW-YORK 10017
(U.S.A.)

Cher Monsieur,

Je n'oublie pas nos conversations de Décembre dernier, et je vous fais parvenir, sous un autre pli, le petit dossier que j'ai établi à l'intention de Monsieur Blanchard et Monsieur de Givry, à la suite de mon voyage en Asie du Sud-Est.

Le voyage que j'ai l'intention de faire aux Etats-Unis se confirme. J'y serai probablement du 1er au 18 Juillet 1976. Pendant la semaine du 12 au 17, je serai à l'Université de Maryland, près de Washington, au Congrès de l'Association Internationale d'Ergonomie (x).

Je ne suis pas encore certain de mon emploi du temps de la première semaine mais je pense rester sur la côte Est et, probablement, à New-York. Peut-être aurai-je ainsi l'occasion de vous rencontrer.

Veuillez agréer, cher Monsieur, l'expression de mes sentiments dévoués.

A. Wisner

(x) 6th Congress of I.E.A.
Congress Chairman : Harry L. Davis
Human Factors' Section B.56 K.P.D. Eastman Kodak Company
Rochester, New York 14650 U.S.A.

1er Juin 1976

Monsieur Bernard Fortin
Directeur du Cabinet
Direction Générale du B.I.T.
CH 1211 GENEVE 22 (Suisse)

Cher Monsieur,

J'avais emporté avec moi, comme lecture de week-end, le rapport PIACT destiné au Conseil d'Administration du BIT, et j'avoue que cette lecture m'a profondément réjoui. Non seulement j'y ai retrouvé certaines vues qui me sont chères mais, encore, je les ai trouvées insérées dans le vaste mouvement qui porte le BIT depuis des dizaines d'années, ainsi que les diverses organisations internationales.

Je crois, en effet, comme vous, à la nécessité de rénover profondément les conceptions en matière de conditions de travail et de sécurité, et de ne pas se limiter à la législation, à la normalisation et au didactisme formel, mais je crois également que, dans bien des cas, il faut aussi employer la vieille artillerie lourde.

Sur bien des points j'ai très envie de collaborer à la réalisation du PIACT mais c'est de vous que j'attends mon affectation, en tenant compte du fait que naturellement j'aime mieux agir sur place en analysant la situation, en choisissant les hommes et en organisant des dispositifs, qu'à Genève à rédiger des documents.

Je vous adresse ci-joint le texte d'un exposé que je vais faire au prochain congrès de l'Association Internationale d'Ergonomie sur un des aspects du PIACT.

Veillez agréer, cher Monsieur, l'expression de mes sentiments amicaux.

A. Wisner

P.S. Je ne fais pas part de mes sentiments à Monsieur de Givry car il ne m'a pas encore adressé ce document, probablement par discrétion vis-à-vis du Conseil d'Administration.

Informal Consultation relating to the
Launching of the International Programme
for Working Conditions and Environment

(P I A C T)¹

Bangkok, 12 - 13 February 1976

Working Conditions and Environment

The conditions under which men and women perform their daily work lie at the heart of the ILO's mandate. This was strongly re-emphasised by the International Labour Conference at its last session in 1975. After a thorough discussion of the Director-General's report which was entitled "Making Work More Human", the Conference unanimously adopted the Resolution concerning Future Action of the International Labour Organisation in the Field of Working Conditions and Environment. This Resolution "solemnly reaffirms that the improvement of working conditions and environment and the well-being of workers remains the first and permanent mission of the ILO".

The Resolution earnestly invites member States:

- (i) to promote the objectives of the improvement of working conditions and environment with all aspects of their economic, educational and social policy;
- (ii) to set periodically for themselves a number of definite objectives designed to reduce as far as possible certain industrial accidents and occupational diseases or the most unpleasant and tedious of jobs;
- (iii) to normalise the application of scientific research so that it is carried out for man, and not against him and against his environment.

Moreover, the Resolution has supported the world-wide action suggested by the Director-General in his report with a view to re-considering the current activities of the ILO and to launching an international programme for the improvement of working conditions and environment which is designated to promote or support activities of member States in this field. The Resolution has specified that such a programme should be drawn up "after consultation with the competent international organisations as well as with the national, regional and international bodies specialised in working conditions and environment". These consultations are under way.

¹ French initials of the Programme

It is thus clear that ILO action with regard to working conditions and environment should be given a strengthened emphasis in the next years and the general objectives should be:

- (i) to encourage member States to set for themselves a number of definite objectives for the improvement of working conditions and environment and for the establishment of national programmes for the achievement of such objectives;
- (ii) to provide support for the implementation of these national programmes in assisting governments, employers' and workers' organisations in the preparation and carrying out of programmes for the improvement of working conditions and environment which correspond to their potential;
- (iii) to assess periodically the progress made in the implementation of the national programmes towards the achievement of the objectives thus defined.

Many of the specific activities of the ILO to meet these objectives will only be determined when the consultations requested by the Conference have been completed, and such activities will have to be constantly readjusted if the international programme to be launched in 1976 is to be truly dynamic and responsive to the needs of member States.

With a view to collecting the views and suggestions of the participants to the consultation, the following points are proposed for discussion.

I. Problems, Needs and Trends in the Field of Working Conditions and Environment

1. What are the main needs with regard to working conditions and environment? What is the general situation at national level as to occupational accidents and diseases? Trends of frequency, severity rates and needs in regard to their prevention? What are the main problems in this respect?
2. Do there exist specific national programmes or strategies aimed at improving working conditions and environment?
 - i) National laws and regulations.
 - ii) Institutional arrangements in regard to official services for occupational safety and health. Are different sectors of activity covered by different administrations? Is there a tendency to set up a central authority to deal with occupational safety and health in all sectors and branches of activity?

- iii) Inspection facilities to verify the implementation of the occupational safety and health legislation in the undertaking by services not forming part of the undertaking (official services and other services empowered by the competent authority).
 - iv) Research and information institutions (official, semi-official, private).
 - v) Role and functions of social security institutions in prevention of occupational accidents and diseases, including private accident insurance institutions.
3. What is the management's attitude towards occupational safety and health and working environment?
 4. Is there any workers' participation in the design and implementation of occupational safety and health and conditions of work programmes in the undertaking?
 5. What is being done with regard to education and training in occupational safety and health and working environment in general (primary schools, professional schools, universities)?
 6. Are mass-media used for information of the public at large?
 7. Which methods could be used for defining specific objectives to improve working conditions and environment and for evaluating progress in the attainment of such objectives? What specific targets should be set up concerning the reduction of dirty, noisy, difficult or unpleasant jobs? What are the industries and occupations where the worst working conditions are found?
 8. What are the consequences for conditions of work and occupational safety and health of the various technologies being adopted in developing countries? What specific measures could be utilised during the development of industrialisation projects in order to adapt imported technologies to the social cultural pattern of the labour force? Are there any studies on the possibility of adapting traditional forms of work organisation to industrial work?
 9. Economic and social advantages of various measures referring to the improvement of working conditions and environment?
 10. Is there a need for a specific programme for improving conditions of work and environment in the rural areas? Indicate what specific action should be taken at national level with respect to conditions of work in the rural sector (hours of work, holidays, social services, housing). Extension of labour inspection to rural areas. Development of safety and health training for rural workers.

II. ILO Action

A. Standard-setting

11. Is there a need for new ILO standards in this field? On what subjects? Do you think that new initiatives are needed at the international level concerning the length of working time? What are the main problems? High legal maxima in agriculture? Excessive overtime? Insufficient reductions in working time for specially arduous work? Shift and night work?
12. Would it be advisable to prepare a comprehensive international instrument providing a framework of national policy for occupational safety and health and the improvement of the physical working environment?
13. Have you any suggestions for improving the application of existing instruments?
14. Is there a need for revising some of these standards?
15. What should be the role of the sectoral approach (industry by industry) in implementing the PIACT? (role of Industrial Committees?)
16. Would it be advisable to prepare further codes of practice (which may be adapted to national or local conditions) for specific sectors or branches of activity or specific hazards? For which sectors or in regard to which hazards?
17. What rôle should be reserved to the regional approach (e.g. Regional Conferences) in the implementation of the PIACT?

B. Research and Reports

18. What sort of research should be undertaken by the ILO (big comparative studies; articles on trends; contributions to outside meetings)? Should comparative studies normally be undertaken for submission at ILO Conferences, industrial committees and/or expert meetings or as independent research projects? How can the ILO stimulate research at the national level? Should assessment of national needs and resources for implementing a nation-wide programme on working conditions and environment be systematically promoted?

C. Clearing-House

19. How can the ILO best contribute to the collection and dissemination of information with regard to working conditions and environment?
20. Role of C.I.S. ? of the Social and Labour Bulletin? of the General Conditions of Work Series?
21. Should simplified fact-sheets on specific subjects be of use?
22. Role of symposia and seminars for exchanging information. At what level (international, regional, national, or sectoral) ?
23. Is there a need for developing audio-visual aids apart from publications to assist in information and education campaigns?
24. Should governments, employers' and workers' organisations be encouraged to address more requests for information to the ILO concerning developments in other countries, so that dissemination of information can be adapted to the particular needs of the author of the request?

D. Technical Cooperation

25. Would pilot missions of the multidisciplinary team referred to in the Conference resolution be of use in your country? If yes, indicate what should be the composition of the team and what should be its field of action?
26. Is there a need for technical cooperation in the field of conditions of work?
27. What are the best forms of technical cooperation to improve working conditions and environment :
 - i) assistance in labour legislation
 - ii) strengthening of labour inspection services
 - iii) strengthening of the labour management relations machinery and, with respect to rural areas, assistance in promoting the establishment of rural workers' organisations?

- iv) establishment of national occupational safety and health institutes (to deal with applied research as well as with education, training and provision of information at large).
 - v) provision of fellowships
 - vi) advice for the setting up of plant occupational safety and health programmes
28. Should special efforts be developed to promote training schemes for "barefoot" safety delegates especially in small undertakings and rural areas?

3.2.1976