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Training Workshop for
Personnel Engaged in Standardization [1]

Addis Ababa, Ethiopia, 17 - 24 November 1970

TRAINING FOR STANDARDIZATION [2]

by

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1/ Organized by UNIDO (United Nations Industrial Development Organization) in collaboration with ECA (Economic Commission for Africa) and ISO (International Organization for Standardization).

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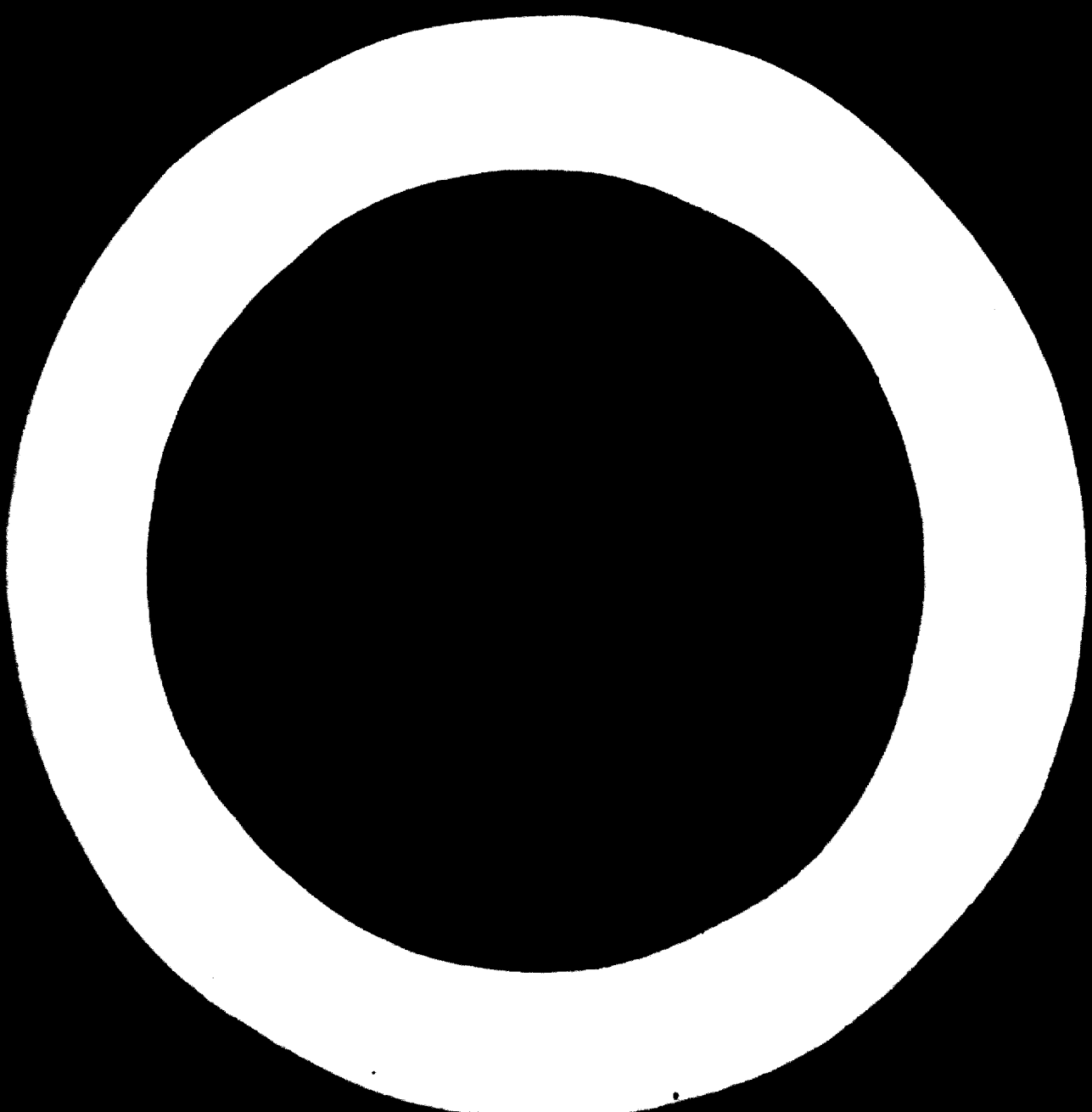

1. GENERAL ABSENCE OF STANDARDIZATION FROM REGULAR CURRICULUM OF INSTITUTIONS FOR HIGHER LEARNING

Training of standardization personnel is conducted in most of industrialized countries as a continuous action, aiming at the improvement of personnel qualifications. There is a unanimous agreement as to the need of standardization development and of accustoming both the engineers and the consumers to utilize the rules of standardization in their everyday technical and practical activities.

Such training belongs to the initial level of training and it corresponds in practice to the levels zero and one as defined in the classification of training proposed in par.4. of this work. The corresponding programs utilized in various countries are described in par.3. However, in the institutions for higher learning there is no training in standardization and in the domain of utilization of scientific methods in establishing all standardization rules.

The absence of standardization training in higher learning is due to the fact, that the standardization does not set tasks to the basic disciplines of science /of par.2/. Another reason why such a situation exists is, that the standardization has been based nearly exclusively on the experience of production specialists. The requirements given in the standards have been based only on this experience, neglecting sufficient scientific studies and mathematical interpretation of experimental results by means of the theory of prediction and decision modelling. In the first stage of creating a new branch of science - such as

standardisation should become - it is necessary to define its tasks and the area of its intervention into standardisation activity. /Fig.1. Place of intervention of standardisation science/. With this aim a graph /fig.1/ has been prepared showing the contribution of standardization to technology and economy in connection with other activities linked to standardization.

A visual ascertainment of overlapping of these activities makes it possible to define the places /hatched/ of common interest and the places /shaded/ of science interference into solving difficult economic problems specific for standardisation.
Standardization must make a great leap in order to become a branch of science in which the solutions of important problems of economy would be based on a theoretical analysis.

It has been so far impossible to create a mathematical model of this visual representation of the interference of science into standardization work. It is only possible to present the problem in a descriptive way.

The aim of creating the mathematical model is to construct a basis for decisions made while establishing the rules of standardization. These decisions are of various kinds and may be divided into several groups. They may be based on:

- economic analyses
- technical analyses
- the results of the studies of materials and aggregates
- the informations obtained from other analytic centres.

The decisions are made on the basis of interpretation of technical and economic parameters variations, compiled from observation and worked-out statistically.

Each group of decisions is characterized by certain parameters which are essential to it, while other parameters may be equal zero.

In this way it is possible to reduce the number of parameters being analysed and constituting the base for decisions.

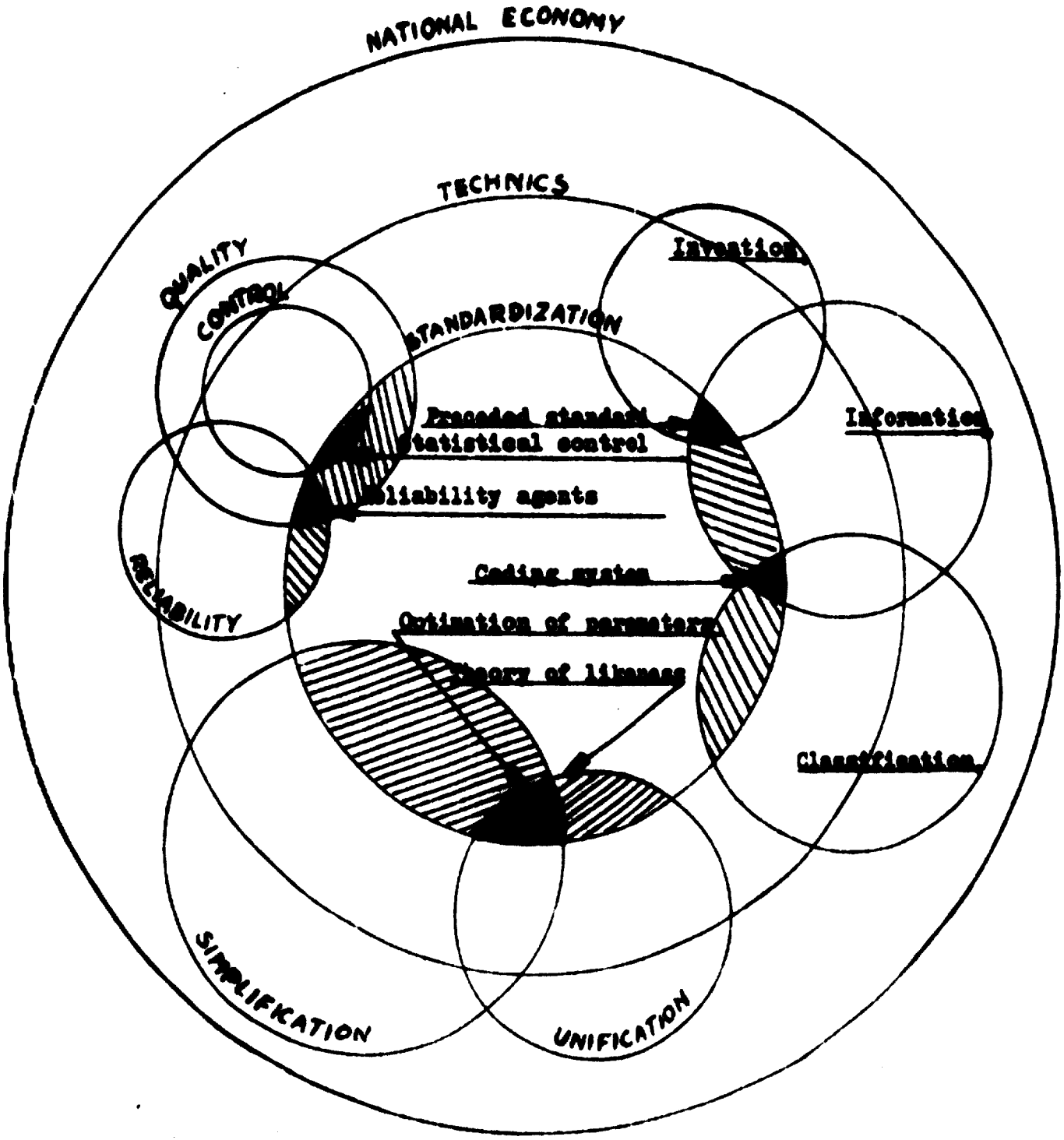

Fig. 1. Place of intervention of Standardization science

Scientific interpretations of gathered data are subject to analysis in many countries and the methods of analysis generalized for common use will be gradually utilized by standardization.

2. MULTI-DISCIPLINARY ASPECT OF STANDARDIZATION

Standardization takes advantage of the achievements of many branches of science in preparing methods which are utilized in establishing requirements given in standards.
Mathematics is the basic branch of science utilized by standardization. Its various disciplines such mathematical statistics, optimization methods, prognosis theory etc. constitute the basis for adopting correct decisions in establishing provisions in standards. At the same time, they make it possible to plan standardization work directed by the development of science and technological processes.

The instruction of standardization personnel /cf par.4/ should cover both the theories formulated by disciplines of science and their practical applications as methods for direct use.

In order to find scientific solutions of technical problems standardization sets the tasks to be solved, while the science provides methods which are most effective in solving them. In view of the utilisation of mathematics in standardization a symposium was organized in Warsaw in 1969 on the initiative of ISO/STACO. It was the first symposium to discuss the connection of standardization tasks with mathematical methods. This connection is shown in table Nº 1.

Upon a discussion about the priority of standardization problems in economy it has been established that the theme of the next symposium will be "Mathematical models of decisions"

The interconnection of scientific disciplines and their specific methods with the instruction of standardization is of a feedback character, with all these activities influencing one another. A sheme of multi-disciplinary aspect of standardization is shown in fig.2. The instruction of standardisation

Table 1

Standardization questions and problems	Same analogues of mathematical methods connected with standardization
1.Estimation and Control of Quality	Theory of probability
1.1.Quality of products	Mathematical statistics
1.2.Quality of production /process of production/	Stochastic processes
1.3.Quality of test systems	
2.Reliability of objects and systems	Mathematica analysis and analytical functions
	Theory of probability
	Stochastic Processes
a/ reliability of objects	Mathematical statistic /all mathematical and statistical method have found here application/
	Theory of community /mass/ service
	Theory of reneval
b/ raliability of systems	Mathematical logic two and multi-value
	Theory of graphs
	Methods of combinations
	Theory of probability
	Stochastic processes
.3. Standardization information	Mathematical statistics
	Mathematical theory of informatics
a/sources and preparation of information	
b/classification and coding	
c/transmission of information	
d/methods of data verification and control	
e/education in standardization methods	
4. Simplification /typication/	Mathematical analysis
a/ choise of criteriae	Linear and non-linear programming
b/ role of parameters	Statistical decision problems
- number of dimensions of series	
- number of types	
- sequentiality	
c/ optimation	
5. Rational application of raw maretials and materials	Linear programming
	Dynamic programming
6.Effects of standardization	Mathematical statistics
	Theory of games
	Econometry
7.Standardisation programmes	Stochastic processes
	Extrapolation questions
	Theory of control systems

It can be seen, on the basis of the abowe, that certain fields of mathematical knowledge are indispensable for developments in the standardisation domain.

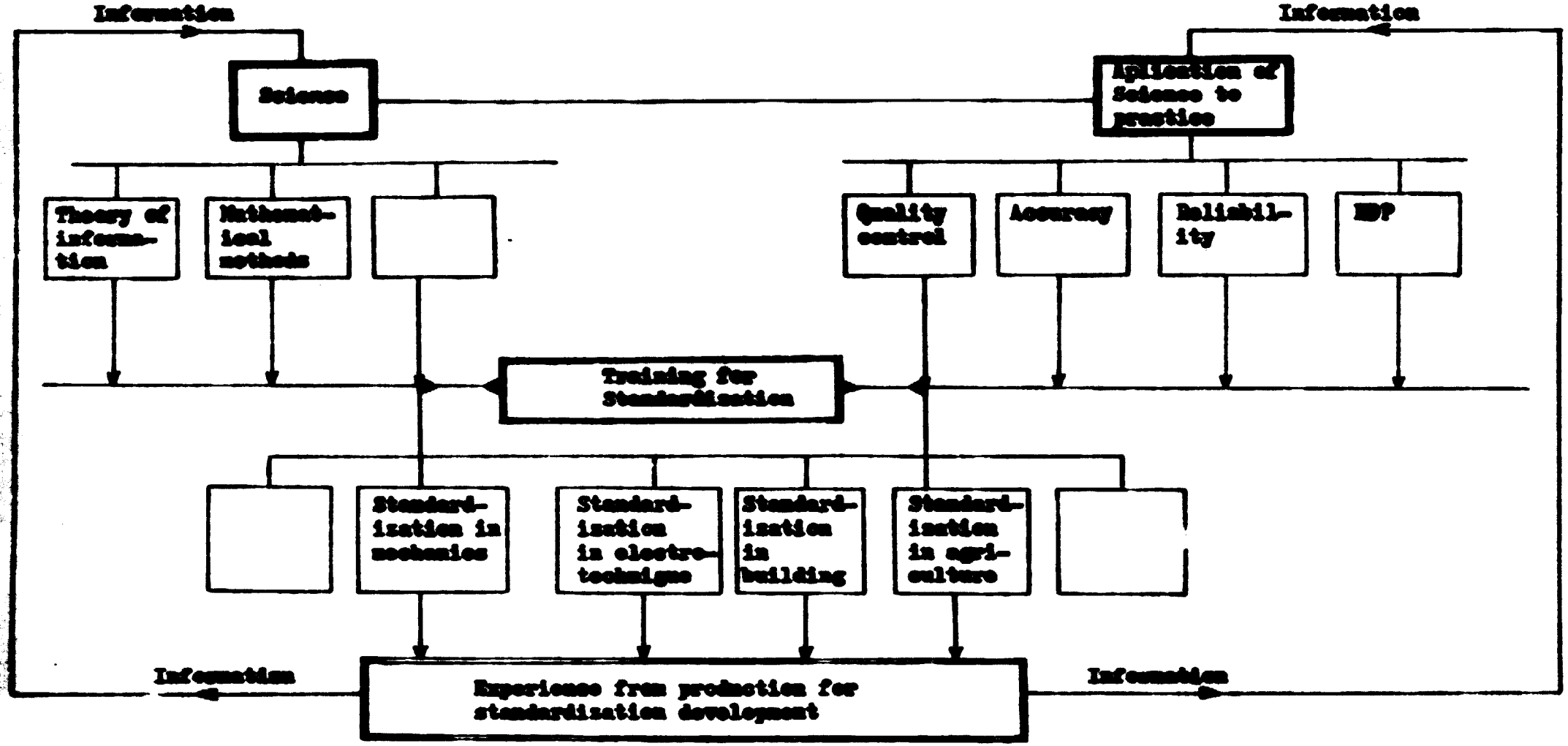

Fig. 2 Multi disciplinary aspect of Standardization

should utilize in the degree appropriate to various levels of training the achievements of the scientific disciplines used in standardization. The influence of standardization on industrial achievements and the facilitations in production and commercial activities should be observed. The results of these observations should lead to the improvement of the system of training and scientific methods utilization.
Such a system corresponds to the new, active part payed by standardization, finding its expression in working out prognosis of standardization plans both in the domain of designing and that of production organization, including planning of products quality according to differentiated objectives. In pursuing such an activity it is necessary to set up standards of guiding character, for instance "Preceding standard". The tasks of such preceding standards are different depending on whether the standards are to unify a diversity of products, to define the products to be produced, or to improve the quality of existing production processes.

The characteristic of the function of research in standardisation refers to the basic questions, namely - obtaining informations about the method of investigations, the values of observed parameters and their variations in the surveyed period, and utilization of these informations to improve the existing conditions and working out a prognosis for the periods in which standardization stabilization should take place.

This process is shown shematically in fig.3. It consists of a period of observation and qualifying the variation functions of the parameters which are subject to the analysis, and of variation periods based on predictions worked out according to the prognosis theory for short /e.g. two years/ periods and long /e.g. ten years/ periods. As the development of the situation is observed and compared with the results of short term prognoses it is possible to introduce corrections into the predictions, or even to change completely the direction of observed parameter variation.

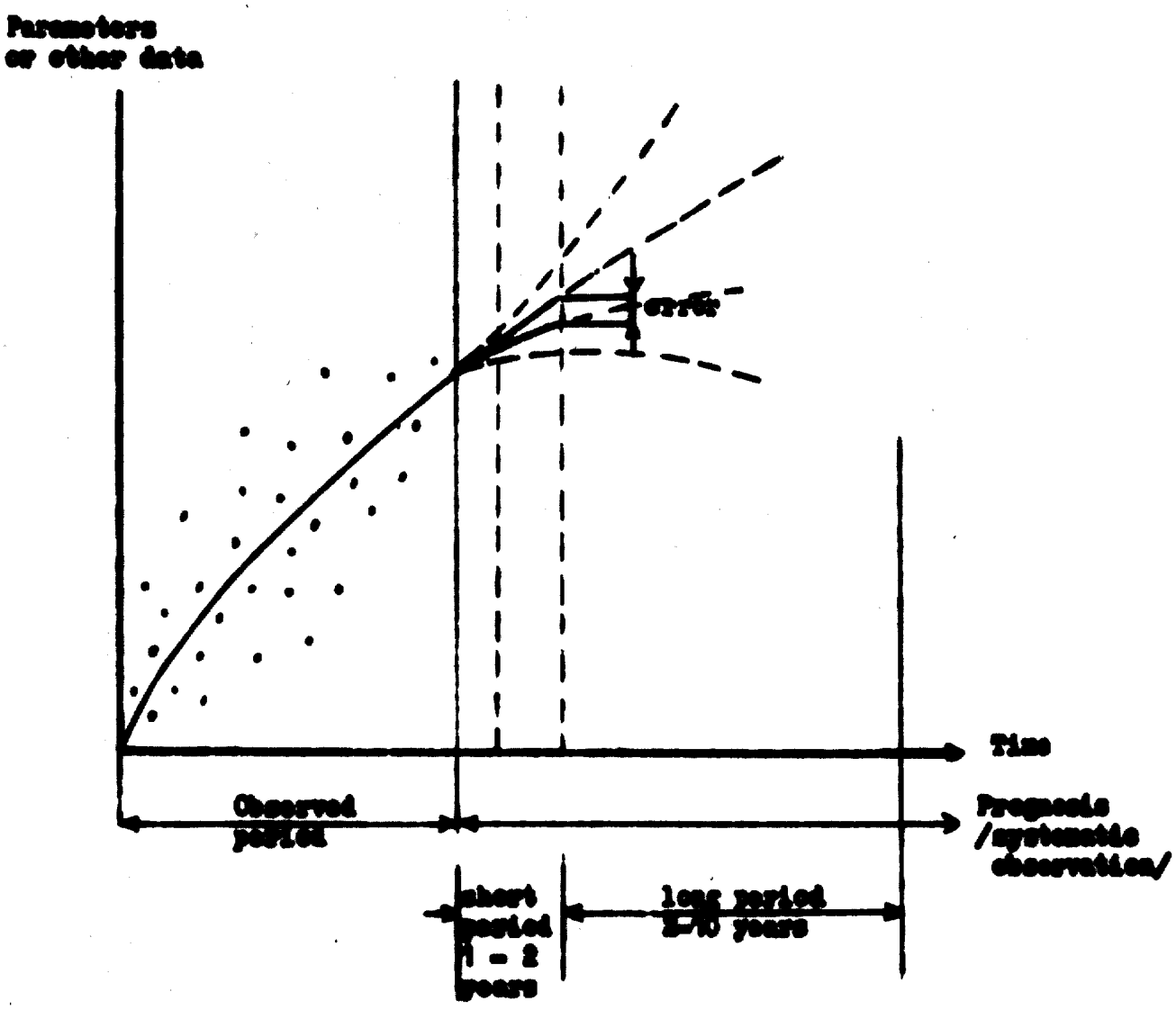

Fig. 3. Prognosis of technical parameters for standards

In the detailed formulation of prognosis it is necessary to take into account sudden accidental conditions, such as floods, earthquakes, temperature perturbations etc. which may influence the variation of parameters, and therefore their standardized values.

3. EXISTING TRAINING PROGRAMMES

The existing training programmes in the domain of standardimation in various centres and countries correspond still to random training at various levels of instruction. Moreover, not all the levels are represented. The programmes are characterized by a specialistic profile of training, mostly on the second level for standardization staff in national standardization commitres or in industry.

The programmes can be classified according to the method described in par.3. Detailed scopes of lectures and practical training are given in the annex together with indications for whom the training was organized, what was the programme of lectures and how much time was devoted to it.

4. NEED FOR ORGANIZING TRAINING COURSES AT DIFFERENT LEVELS FOR STAFF OF NATIONAL AND COMPANY STANDARDIZATION CENTRES

The instruction of standardization, as that of any other branch of science, should be differentiated in the level of training. The difference consists both in the theoretical preparation of students and in the programme of lectures, covering stage by stage more and more difficult problems.
The concept of the progressive and specialistic instruction of standardization leads towards working out systematic programmes adopted both to the possibilities of students and to the needs of industry.
It is expected that the instruction will be purued at three levels in scientific and industrial organizations. The improvement of qualifications should be at the same time accompanied by a possibility of obtaining scientific degrees. A fully developped conception of standardization instruction will

facilitate brining scientific methods into solving difficult economic problems by standardization activity.

The conception of progressive standardization training is shown in fig.4.

Firgt level of training is assigned for students who have middle or higher technical and economic education. The programme should be prepared so, as to give the student a general competence in preparing the draft of a standard, in gathering statistical data, their necessary interpretation and the art of observing the influence of the standard on industry. Aming general matters the programme should cover general characteristics and tasks set for the standardization in the national economy, the connection of this economy with the international economy and the art of drawing conclusion for standardization from the participation of the country in world production. This level of training is not sufficient for leaning an independant standardisation work, but gives a general idea about standardization and its use, so that the participants of the course may after its completion take part in the standardization work under the leadership of an experienced standardization worker.

Second level of training is assigned for the staff of the National Bureau of Standards /NSB/ and for company standardization staffs and should ensure full competence in preparing a standard, working out its technical and economic interpretation, skill in working out statistical data using mathematical statistics and use of classifications and coding systems. Moreover, in the domain of specialistic problems the programme should give a possibility to prepare standards and their analyses on high scientific level with the use of mathematical methods, and to take advantage of research and scientific solutions of technical problems to set accordingly the requirements in standards.

The students completing training on this level should have higher technical or economic education, and besides knowing general economic problems they should be specialists in their fields of work due tu their studies and practice.

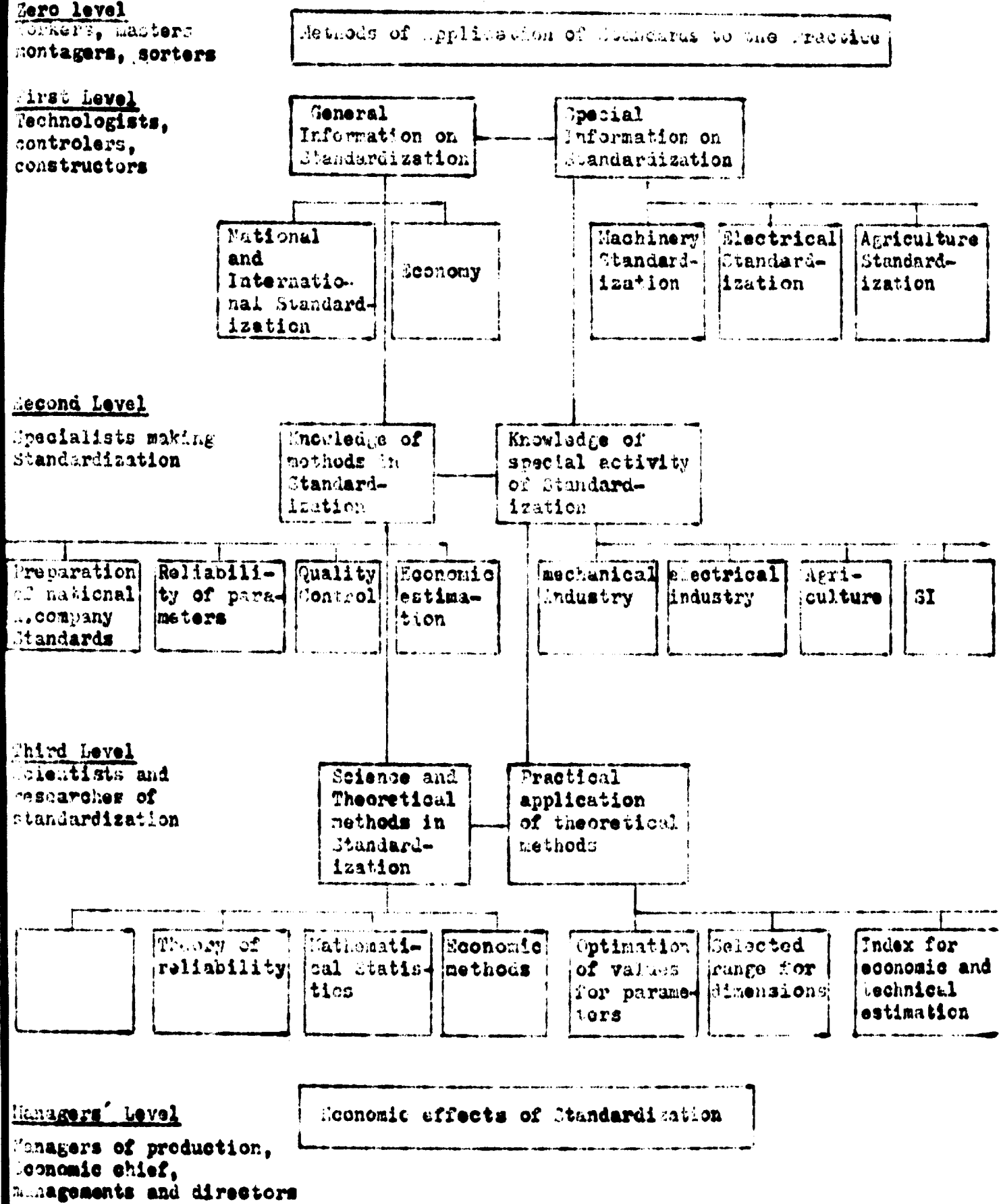

Fig. 4. Concept of progressive standardization training

The whole staff of NBS should constitute a team of specialists, complementing one another both in respect of the methods of standardization work and of the standardization policy adopted by a given country.

The programme should also provide the skill of cooperating in international standardization organizations and international specialistic organizations leading standardization work. This will ensure, that the country will profit from international scientific achievements in the field of standardization.

Third level of training is assigned for learning the theory of standardization and preparing scientific methods for use in programming standardization work. The programme on this level should ensure competence in utilising such scientific disciplines as mathematics, physics, chemistry, should cover the principles of contemporary information theory, systems of industry management and the utilisation of descriptive languages in standardization work. Those economic problems which are largely connected with standardization should be treated as complexes of interconnected problems, taking into account the amount of work and resources necessary in production of standardized products, their classification into sorts and connected with it diversification of prices according to the characteristic of a given sort of product. The questions of export of goods and their standardization according to the international requirements should be covered by the programme as the basis of standardization.

The students finishing training on this level who have the degree of Master of Sciences should prepare a scientific work in the domain of technology or economics on chosen subjectifs and after necessary studies they should obtain scientific degrees of Doctor of Technical Sciences.

These three levels of instruction concern standardization workers, for whom standardization is the basic professional activity and give real skills in the domain of standardization. It is however also necessary to give an encyclopedic knowledge of

standardization to the workers, who have some connection with it in their professions. Two levels of training may be discerned here. The first - zero level - for the workers who directly perform certain tasks, e.g. setters, workers, mecanics, foremen, shunters etc., covers information about employing and utilization of standardizations and teaches using standards as tools for direct execution of production tasks. On the next level - training for managers - the programme should give information about effectiveness of standardization as an element of technical and economic processes of production and both domestic and foreign trade. It should also revert to the existing system of economy in the country and to the possibilities of economic developments in view of general achievements of international standardization. It is therefore a popular formulation of standardization problems for managers. Laying stress on the efficiency of standardization in solving economic problems of the country.

The scheme of standardization instruction described above is not yet fully realized even in highly industrialized countries. Progressive development of standardization theory and its practical application in industry is still continuing and brings significant advantages to the economy of every country pursuing standardization activities.

5. PLANNING AND IMPLEMENTATION OF TRAINING PROGRAMMES

Standardization instruction should be realized in an organized way by outlining a full programme of training. In order to create such a programme it is necessary first to trace out the training, according to the level of training defined by the personnel to be trained.

The instruction may be started simultaneously on several levels, defined according to the needs of the country. In choosing the levels of instruction it is necessary to ensure their implementation and to organise practical training necessary for the students.

If the planning of instruction is based on the levels of instruction described in par.4, then the implementation, practical training in standardization activities in NBS and industry and the studies should be organized as follows:

Zero level:

Documents

Standardized technical specification referring to the sphere of training.
Standardized system of weights and measures SI, ISO, R-1000.
Standards of tolerances and fits established by ISO/R for selected branches of industry.
Preferred dimensions and values or series of parameter values for products.
Documents of product quality control and evaluation of statistical quality control.
Standards for joints, assembly, replacement and similar technical solutions of standardized constructions.
Catalogues of standardized parts of constructions, functional solutions.
Regulations for production, control, acceptance and quality evaluation of products, and the regulations of safety and occupational hygiene.
Instruments for inspection and measurement in the standardized system of product evaluation.

Practical activities

Practical application of standards in production at work stations in factory or in product evaluation quality central service.
The conclusions for standardization arising from practical use of standards.

First level

Documents

Complex of national and company standards, general requirements and specialistic standards according to the programme of specialistic instruction.
Decimal classification and other classifications used by ISO, United Nations and the method of numbering and finding standards in domestic and foreign catalogues.

International standards in selected field and regional and subregional standards.
Standards of contents arrangement and graphic forms accepted in the country, in international standards and in standards of other countries.
Regulations of collecting and gathering information for standardization and economic purposes.
Technical law observed at the moment in selected branches of economy. Standards of statistical quality control.

Statistical yearbooks about the development of industrial production, architecture and agriculture.

Practical activities

Seminars on the arrangement of standards and on the describing of technical regulations on the basis of available informations.
Training in standard application in factory.
Training in standard application in design and construction officers. Preparation of an independent report with the conclusions following from the training completed in a factory or design office.

Second level

Documents

Complex of national and company standards, general requirements and specialistic standards if the programme concerns a selected branch of industry.
Scientific and research papers concerning the application of scientific methods in standardization.
Manuals of mathematical statistics taking into account statistical quality control.
Manulas concerning the employment of reliability theory in system and product standardisation.
Reports on standard employment in a selected field.
Economic papers concerning division of products into sorts, their prices and the relationship between the utilitary values products and their prices.

Practical activities

Seminars on the economics of standardization and on the correctness of regulations adopted in standards.
Independent report on a selected product, showing economic profits due to standardization.
Execution of a training control of standard use in a selected branch of economy.

Third level

Documents

Manuals on mathematics application in standardization concerning linear programming, dynamic programming, reliability theory applications, probabilistic methods, optimization methods, and network methods.
Manuals on economics, theory of information, prognosis theory, decision theory, digital computer application, and digital computer programming.

Practical activities

Debating seminars on the subjects prepared by the participants.
Independent or collective work on the level of doctor's thesis to obtain the degree of a doctor of technical sciences.

Managers' level

Documents

Films about the development of standardization in factories.
Manuals on the economics of production.
Manuals on the analysis of structure.

Practical activities

Competence in the application of standardization to modify a structure.

Training duration

Two systems are anticipated: with partial or total disengagement from work. The duration of instruction and practical activities depends on the system and level of training and may extend from 14 days to one year. The training programmes given in the appendix show the durations of various kinds of training. For each level described in par.4 it is possible to prepare the programme in two versions, with partial or total disengagement from work.

The programmes contain the number of lecture hours and the number of practical activities during training. On the other hand the distribution of training in time depends on local conditions. The anticipated duration of lectures and practical activities /in hours/ for various levels of instruction is as follows:

	hours for Lectures	Practical Activities	Total
Zero level	25	10	35
First level	60	30	90
Second level	90	50	140
Third level	120	70	190
Managers level	15	5	20

Forms of training

Treining for standardization has various forms, depending on the level of training and on the candidates for training, namely:

courses
seminars
conferences
symposia

The forms of training are connected with the degree of mastering the discussed subject by science and practice, and they may be differentiated according to the materials prepared for training.

6. NEED FOR NATIONAL, REGIONAL AND INTERNATIONAL COOPERATION EFFORTS FOR INSTITUTIONALIZATION.

The conception of cooperation consists in specialising training centres in selected problems, especially in the case of higher level training for which it is necessary to implement the course with specially chosen materials and industrial and scientific installations and above all - to provide a highly qualified body of lecturers.

The levels zero and one do not require such highly qualified lecturers and may be conducted in a country by its own means under a general supervision of an expert in this field. The other levels, however , require directing training so as to obtain a uniformity of training, so important from the standpoint of standerdization. This uniformity of training will lead ~~to the uniformity of training will~~ lead to the uniformity of standardization activities in various countries, and subsequently to the uniformity of standardization activities in the whole world. The existing industrial and scientific centres which have already been specialized in selected fields should be utilized for cooperation purposes upon supplementing their programmes with such aspects of standardization training as arise from the specific character of production, climate or tradition in the country.

Cooperation in Subregion and Region Scope

The analysis of standardization problems in African countries worked out by the experts from three countries on the commission of ECA has made it possible to select some centres of scientific research or training which will conduct training in selected groups of problems. They are e.g.the following:

Guinea - Conakry Polytechnic College
Nigeria - Federal Institute of Industrial Research, Oshodi.
Ghana - Building Research Institute
Liberia - University of Liberia, Science Division
Ethiopia - Ethiopia-Swedish Institute of Building Technology
Senegal - University of Dakar, Faculty of Science.

Specialization in training is an important feature of cooperation in Region and Subregion scope.

International Cooperation

In the present state of organization of international institutions the following organizations may realise standardization training in the fields shown in table 2.

TABLE 2

Organisation and its specialized organ.	Scope of training
ISO/ International Organization for Standardization/	
STACO/ Standing Committee for the Study of Principles of Standardization/	Theoretical work and methods used in domestic and international activities.
PLACO/ Planning Committee/	Planning and programming of standardization work according to the needs of the country, subregion and region.
INFCO/ Standing Committee for the Study of Scientific and Technical Information/	Theory and practice of standardization.
United Nations:	
UNIDO/ United Nations Industrial Development Organisation/	General economic and specialistic problems of standardization with special emphasis on industrial technology.
UN/ECA /Economic Commission for Africa/ UN/ECE /Economic Commission for Europe/ and other economic commissions	Organisation of standardization services, national standardization committees, coordination of work in subregions and regions.
UNFAO /United Nations Food and Agriculture Organisation/	Programming and planning research activities for national and international standardization and establishing basic parameters for food and agriculture standards.

BIPM /Bureau International des Poids et Mesures /	Methods of establishing units of weights and measures and installations for their verification.
UNESCO /United Nations Economic, Scientific and Cultural Organisation/	Methods of scientific information gathering for international standardization purposes and preparation of expert lecturers in the fields important for standardization.
Initiative of various highly developed coutries - Members of United Nations	Specialistic subject matter coordinated with UNIDO in the field of standardisation training in NSB, subregions or regions, or in specialistic subjects for selected participants of the course.

All the suggestions given above require working out a detailed programme of activities, so that the efforts of international cooperation should be most effective. The organisation predestined to such coordination of programmes and organisation of efforts is UNIDO, as it has the highest interest in development of industry, which is the basic feature of standardisation activity.

ANNEX

Programmes of training

for standardization used by selected countries

British Standards Institution

The Standards Associates Section of BSI provide three types of course, as follows:

		Classification used in point 4 of the report
Type A	Aim. To give management executives a general understanding of the principles of standardisation at home and abroad and how they should be applied in a company to increase efficiency and lower costs. Attendance. General managers and senior executives. Duration. 1-2 days	Training for Managers
Type B	Aim. To bring standards engineers up to date on standardisation matters, review general principles of standards work, discuss their problems and exchange ideas. Attendance. Standards engineers. Duration. 3-5 days.	Second Level
Type C	Aim. To train junior standards engineers. Attendance. Those recently appointed, or in line for appointement as standards engineers. Suggested duration. 4 days /or equivalent in broken periods/.	First Level

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SECOND LEVEL

British Standards Institution
and Bath University of Technology

STANDARDIZATION

Type B Course for engineers, accountants and other managers

Programme

Subject	Hours for Lectures
The Role of the B.S.I. and International Standardization	1,5
Quality Control	1,5
Coding and information retrieval	2,0
Value Analysis and its Implication for the Standards Engineer	1,5
Case Studies on Metrication	1,5
Product Variete Control	1,5
The Computer - a Tool of the standards Engineer	1,5
Management of Standardization Policy	1,5
Standardization and Costing	1,5
Concluding Discussion	2,0
Total hours in three days	16

British Standards Institution

SECOND LEVEL

Type B Standards Course

Objectives of the Course

The series of lectures is designed to provide an understanding of the general principles of standardization and guidance on the application of standards in a company. The course will be of benefit to the type of person who would ultimately create the nucleus of a company standards department and in addition will be of interest to those concerned with management who wish to gain an appreciation of standards and their use as a management tool. Personnel already engaged in standards activities can benefit from the opportunity provided by the course to compare their thoughts and efforts with those of others working in similar fields.

Outline

The course consists of nine lecture sessions of about two hours each. It is expected that about 45 to 60 minutes will be taken up by the lecture itself and this will be followed by discussions.
Auxiliary activities such as conversazioness, visits etc., will depend on local circumstances. The course can be arranged over a period of nine weeks with one session per week, or alternatively, as a residential course with auxiliary activities interpolated at suitable times.

Programme

	Lecture
Lecture 1.	Introduction to standards and the place of standardisation in the national economy.
Lecture 2.	International aspects of standardisation.
Lecture 3.	The change to the metric system.
Lecture 4.	How standards operate in a company and the organisation of a standards department.
Lecture 5.	Product standardisation.
Lecture 6.	Classification and coding.
Lecture 7.	Variety control.
Lecture 8.	Local interest subject.
Lecture 9.	Review of course.

University of Strathclyde and
British Standards Institution

MANAGING LEVEL

TYPE A

Four day study Course
PRODUCTIVITY AND PROFITABILITY THROUGH STANDARDISATION

Aim of course

This course will review the principles of Standardisation and metrication as applied both nationally and internationally.

Application taken from manufacturing industry will form a basis for discussion and will relate standardisation to Design, Manufacturing and Marketing.

The emphasis throughout will be on economic benefits.

Who should attend the course ?

Works and Production Managers, Industrial and Production Engineers, Standards Engineers, Company Standardisation Officers, Product Designers, Chief Draughtsmen, Costs and Works Accountants.

Programme

Subject of Lecture	Hours
The place of British Standards Institution in the National Economy	1,5
Modern Trends in Standardisation	1,5
The application of Standards in Industry	1,5
Standardisation inside the Company	1,5
Metrication	1,5
International Standardisation	1,5
Standardisation in Design and Components	1,5
Group Technology	1,5
An Example of Company Standardisation	1,5
Standardisation and Product Range Policy in Marketing	1,5
Standardisation in Organisations and Methods	1,5
Standardisation in Shipbuilding	1,5
Productivity and Profitability through Standardisation	1,5
General Discussion and Summing up.	3,5
Total	23,0

British Standards Institution and Manchester Institut of Science and Technology

MANAGERS LEVEL

TYPE A

Standards Course

Programme

Subject of Lecture	Hours
Management of a standardisation policy	1,5

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Product variety control-marketing and product policy	1
Value analysis and its implication for the standards engineer	2
Case study on product policy	1,5
The role of British Standards institution in the national economy and in international standardisation	1,5
Information retrieval and presentation through classification and coding	1
Component variety control:	2
- in design - in group technology /practical application/	
S.I. Units	1,5
The change to metric	1,5
Variety control - material and bought out commodities	2
The computer - a tool of the standards engineer	1,5
Variety control - stock and purchasing	1,5
Summing up the course and discussion	2,5
Total	21

Association Française de Normalisation

FIRST LEVEL
Three days

Programme et Gestion de la Normalisation dans l'Entreprise

Programme du stage

L'Entreprise face à la normalisation

Les impératifs des actions de normalisation

Le programme de normalisation.

Les actions de normalisation.

Visite d'un service de normalisation d'entreprise

Previsions et controles des resultats.

Confrontation d'experiences.

Association Française
de Normalisation

SECOND LEVEL
Five days

La Normalisation et l'Entreprise
Stage d'information et de perfectionnement.

Programme

Cours	Heures
Organisation et fonctionnement de la normalisation française et internationale	1,5
La normalisation d'entreprise	1,5
Les organes de la normalisation dans l'entreprise	2
Programme et gestion de la normalisation dans l'entreprise	1,5
Les différentes formes d'expression de la normalisation	2,5
Presentations de cas concrets	1,5
Normalisation et approvisionnement	2
Comment s'établit et s'applique une norme	1,5
Nomenclature et codification dans l'entreprise	2
Données générales de reférence pour la conduite des travaux de normalisation	1,5
Nomenclature et codification dans l'entreprise exercice pratique	1,5
Analyse de la valeur et normalisation	2
La conduite d'une étude de normalisation	2
Normalisation d'entreprise Presentation de cas concrets	2
Les résultats de la normalisation	2
Total	27

Association Française
de Normalisation

SECOND LEVEL
SPECIALISATION
Three days

Nomenclature et Codification
outils du normalisateur

Programme du stage

Necessité d'une nomenclature

Les systèmes de codification

Cas concret: exploitation de nomenclature codée

Cas concret: exploitation de nomenclature codée

Cas concret: exploitation de nomenclature codée

L'importance des codes dans la résolution
des problèmes de temps reel.

Exercice pratique de codification.

Exemples de nomenclatures codées dans l'entreprise.

Confrontation d'expériences.

Polish Standards Committee

SECOND LEVEL

Program of training for standardisation
of the provision section.

Aims of the training

Information for the workers of the provision section for the standardisation and its function for the appropriate problems.

Programme.

Subject of lectures	Hours for Lecture	Hours for Exercise	Total
Bases information on Standardisation	4	1	5
Application of standards	5	2	7
Economic problems of standardisation on the delivery of products	4	2	6
Selected problems connected with the provision, transport, delivery, package, container and stock-piling	10	5	15
Total	23	10	33

Polish Standards Committee — First LEVEL

Programme of training for standardisation for the officer of National Standard Buro

Aims of the training

a/ information on the stage of standardisation in the company, national and international scope of activity;

b/ information on standardization as the agent of the technical progress, development of production, increment of the quality of reproducts as well as the general improvement of a human life;

c/ training of the listeners in the methode organisation and bases of flaw for standardisation as well as with process of standardization works.

Frame programme of lectures and exercises

Title of lectures	Numbers of hours		
	lecture	exercise	Sum
Basis information on standardization	5	-	5
Standardisation and technical progress	4	-	4
Standardisation and economy production	4	-	4
Bases of law for standardization	4	-	4
Organization of standardization	3	-	3
Planing in standardization	4	2	6
Technics of standardization	14	20	34
Application of standards	20	5	25
total	58	27	85
Examination			5
Sum total of hours:			90

Polish Standards Committee

SECOND LEVEL

Programme of the Central Course for standardisation

Aims of training.

Training of the listeners in the work of standardisation in the company standards division, especialy as to the preparation and application of standards.

Programme of lectures, Seminars and Exercises

Subject of lecture	Hours for:			
	Lectures	Seminars	Exercises	Sum
1	2	3	4	5
Theoretical bases standardisation	4	-	-	4
Present tronds of standardization	4	-	-	4
Selected problems of standardization in these:	6	1	-	7
a/ problems of simplification and unification				
b/ economy and effects of standardization				
International standardization	3	1	-	4
Principles of law and organization of standardization:	10	-	-	10
a/ principles of law and for finance of standardization,				
b/ organization of standardization				
Themes and pleming for the work of standardization	6	1	3	10
Technics of standardization:	29	4	40	73
a/ preparation of standard				
b/ structure of standard				

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1	2	3	4	5
c/ language of standard d/ renard numbers and principles for gradation, e/ statistical control of quality, f/ International Standard System for a measures and weights - SI.				
Use of standards and control of application: a/ documentation of standardization, b/ introduction and application of standards, c/ control of use of standards.	14	2	-	16
Publication and information activity	6	-	-	6
Standardisation in the military and documentation for license	6	-	-	6
Examination				5
Total hours	88	9	43	145

.ish Standards Committee

SECOND LEVEL

Programme of the training for the lecturers of the standardisation problems

Aims of training

The purpose of the training is the preparation of the participanses to the independent lectures on the standardisation problems on the all kinds as well as on the all levels of training.

Programme of training

Subject of lecture	Hours for:			
	Lectures	Seminars	Exercises	Sum
Theoretical bases for standardisation	4	1	-	5
Present trends of standardisation	3	-	-	3
International standardisation	3	1	-	4
Selected problems of simplification and unification	3	-	-	3
Economy and effects of standardisation	4	1	-	5
Principles of law and organisation of standardisation	7	3	-	10
Themes and planning of standardisation works	6	2	-	8
Technics of standardisation	22	4	12	38
Uses of standards and control of application of standards	13	3	-	16
Bases of didactics	8	2	-	10
Seminar test	-	-	-	7
Total	73	17	12	109

Note

Seminar test for the participances is carried out on the problem selected by the participance in the scope in which the participance would like to specilised .
The participance should prepare the abreviation of this problem on which he want to give the lecture.

University of Technology
Kraków, Poland

THIRD LEVEL

Seminar od Standardisation for a Doctor Degree of Science

Aims of Seminar

Seminar is devoted for the Listeners having the master degree in one of the selected technology. Aim of Seminar is to give the suitable information on the theory and practice of Standardisation and to prepare the listeners to the independent studies of the economic and technical problems of Standardisation. The next aim is to achieve by listeners the Doctor Degree, after prepared the appropriate paper and to pass described examinations.

Programme of Seminar

First Semestr

Subject of Lectures	Hours for:			
	Lectures	Seminar	Exercises	Sum
1	2	3	4	5
lements of Praxeology	2	2	-	4
kech and bases of Standardsation	8	4	-	12
elected problems of economy or standardisation	12	-	4	16
odern tendency and form of lanning and organisation of roduction as well as design f factories	8	4	-	12
odern tendency of the technoogy and process of production	8	4	-	12
odern tendency and forms of he structures for machinery	8	4	-	12
aw and standardisation probems	6	2	-	8
elected parts of mathematics nd the possibility of applistion to the Standardisation /First part/	18	10	10	28
Number of hours in the first semestr	70	20	14	104

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1	2	3	4	5
Second Semestr				
Selected parts of mathematics and the possibility of application to the Standardization /Second part/	4	-	2	6
Organization of activity for Standardization	8	-	-	8
Planning and technics of standardization	10	4	4	18
Standardization problems and tasks in technology for production of machines	12	4	4	20
Problems and tasks for standardization during design of structure machines	12	4	6	22
Problems of standardization and tasks in the planning and organization of production and design of factories	10	4	6	20
Number of hours in the Second semestr	56	16	22	94
Total	126	36	36	198

Polish Standards Committee

MANAGERS LEVEL

Programme of the training for the managers or directors of the factories.

Aims of training

Aims of training is to give the listeners the general view on the scope, task and effect of the standardisation activity as the one of the many technical methods to influence for the economic process of production.

Lecture

One lecture on the problems containing the following matters:
General definition of the Standardisation,
Scope and function of Standardisation.
Kinds of standards and other related documents.
International co-operation in Standardisation.
Standardisation as the methods of industrial development.
Influence of Standardization on the quality of products and on the improvement of the technology of production.
Influence of Standardization on racionalisation of the used material in production.
Influence of Standardization on the exchange of products.
Saving of consumers by Standardisation.
Role of Standardisation in the work safety.

Time of lecture is two hours.

West German Standards Committee
/Original german/ FIRST LEVEL

Course for Standardisation

Aims of training

Inside training in the Standards Committee of the specialists for standardization has the task to prepare the listeners to the study of the general and special problems of standardisation in technical and economic scope.
Period of time of the Course is described on the 4 days.

Programme

Lectures on the course contain the standardisation problems as follows:

History of Standardisation
Organisation of Standardisation
Information on the Standards
Technics of the preparation of Standards
Activity and achievement of Standardisation
Tactical indication for Standardisation works.

West German Standards Committee
/original German/

SECOND LEVEL SPECIALIZATION

Course for the specialists in the planning and steering system in Standardisation.

Aims of training

Iside training in the Standards Committee of the specialists for planning and steering system in standardisation is needed especialy to retrievel suitable data by the electronic processing. Four days is described as the period of time for the course.

Programme

Lecture on the course contains the following matters:
Planning and structure of the division for standardization.
Organisation and officers for the standards division.
Number of standards and bases for economic gradation.
System of Numbers for the organisation purposes.
Aggregate active system as the rationalisation of the effects in production.
Electronic data processing in standardisation:

- colection of data
- programing
- applicetion

Technical micro-picture of standards
Economy of activity of standardisation inside the Standards Committee.
Analyse of function, costs and effects of standardisation.
Plan on needs and technical purposes of standardisation.
Equipment and means for standardisation action.
Main tasks and aims of DIN.

Committee of Standards, Weights
and Measures Equipments of
Soviet Union
/Original russian/

Course for standardisation

Aims of training

Information on the problems in the quality, economy and metrology for the engineers and other managers of production and trade.

Training on standardization foresees three kinds of courses:

1. Course of bases for standardization for the high school of technology,
2. Course of bases for standardization for the high school of economy,
3. Course on standardization for the secondary school of technics.

Institut of Standardization
Science
Moscow

SECOND LEVEL

Programme of training for standardisation for engineers and managers of factories.

Standardization in:
- chemical industry
- heavy industry
- mechanical industry
- agriculture industry
- electrical industry
- radioelectrical industry
- electronical industry

Economy of standardization in:

chemical industry
heavy industry
mechanical industry
agriculture industry
electrical industry
radioelectrical industry
electronical industry

National Supervision and ministerial Control of the application and observation the standards in production as to the quality and tests of products.

Switzerland Standards Committee
/Original german/

SECOND LEVEL

Programme for five-days course

Subject of Lectures	Hours
Reason, aim and importance of Standardisation	1
Organisation of Standardisation	1
National and international activity of Standardisation	1
Structure of Standardisation activity	1,5
Form and operation of the standards	1
Co-operation in the preparation of standards	1
Preparation of standards	2
Drawings in standards	1
Multiply of the standards	1
Information equipment	1
Tolerances and fits	1
Special tolerances	1,5
Surface and its states	2
Design on the drawing	1
Materials for production	2

1	2
Screw-treads and screws	2
Lifts, elevators and transport equipments	1
Rag wheels	1,5
Classification and coding	2
Period of time for preparation of standards	2
Systematics of specification	1
National and international co-operation in the standardization scope	1
Discussion on the course	2
Proposition for a futura	1,5
	Total 33

United Nations, Economic Commission for Africa
Research Centre for Standardization,
Poland

SECOND LEVEL

Seminar on Standardisation, Basic Units and Adoption of the Metric System

Aim of "Seminar"

Aim of the course is to train the candidates for future standardization activity for the position of the leaders of local /national/ standards organization in those African Countries in which this organization is developed or not yet exist.
This special course contains the problem of introduction of the metric system in the way of standardization activity.

Programme of Seminar.

Lectures	Hours
Standardization as the problem for industrialization and for Regional harmonization of Industry	3
Standardization as a problem for the promotion of trade and transportation in Africa	3
Present situation of standardization in each country partipacing in the Seminar	8

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1	2
Standardisation as a problem for the promotion of trade and transportation in Africa	3
Historical review of the development of basic units of measurement - /lenght, mass and time/	3
The unit of lenght: its definition, replication, measurement and verification /F.P.S. and C.G.S. Systems/	3
The unit of mass: its definition, replication, measurement and verification /F.P.S. and C.G.S. Systems/	3
The unit of time: its definition, measurement and verification	3
The C.G.S. and the F.P.S. Systems compared	1,5
The training of engineers and technicians for a National Standards Organization	1,5
The adoption of the metric system for the African region	3
The implications of conversion from the Imperial /F.P.S./ to the Metric System of Basic Units	3
Organization and programming of the conversion from the Imperial /F.P.S./ to the Metric System /S.I./	8
Discussion on training scheme for standardization in African Countries	3
Working Group session for evaluation of Seminar, Drawing of Raport and Recomendation	3
Total	49

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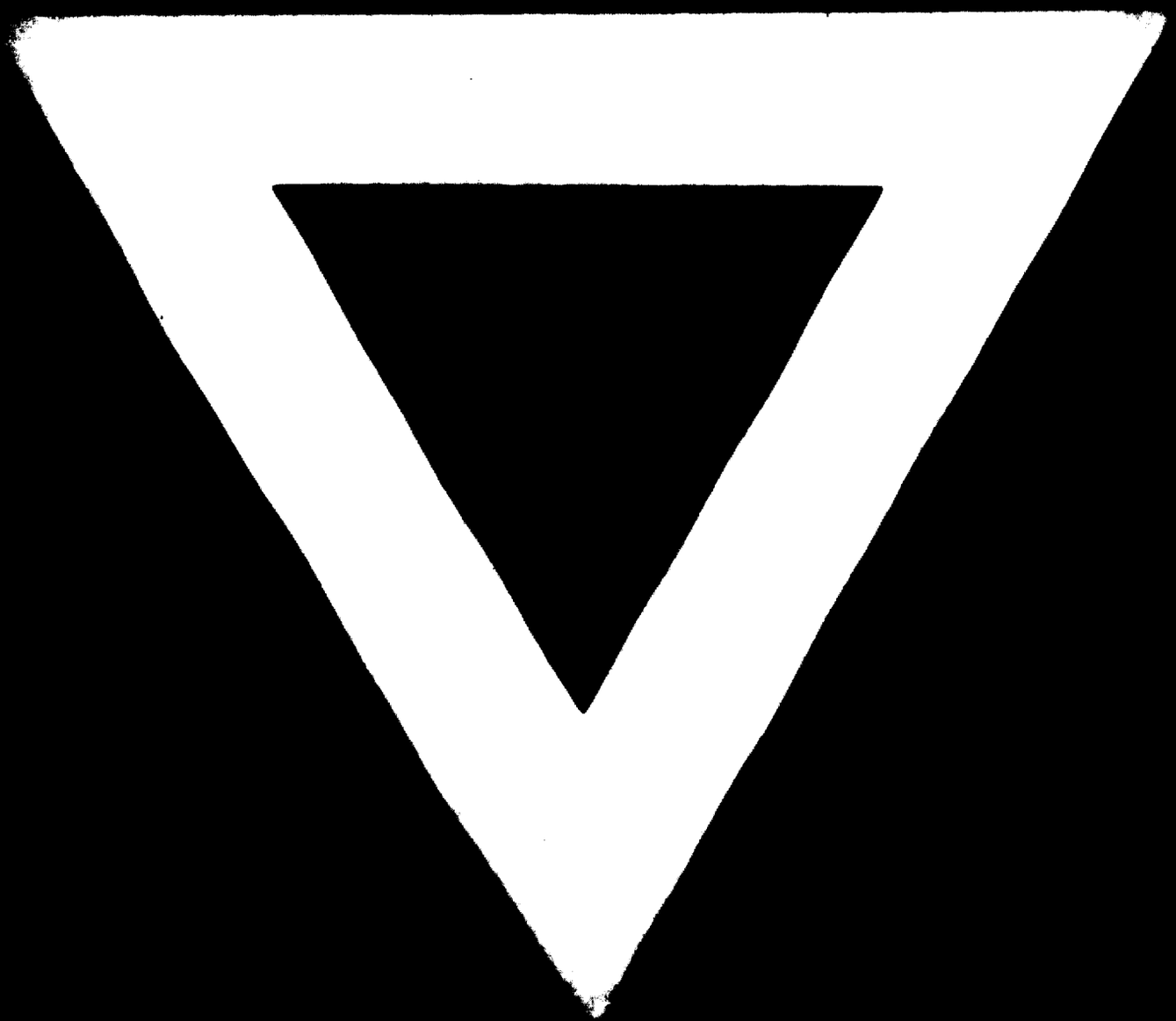

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