I F A C
INTERNATIONAL FEDERATION
OF AUTOMATIC CONTROL

Information Bulletin n° 3

January 1959

CONTENTS

Note on Information Bulletin no. 4

The Information Bulletin no. 4 is expected to be published in April 1959. Information to appear in this issue should therefore reach the Editor

Professor Ing. Dr. Victor Broida
Second Vice-President of IFAC
13, rue de la France-Mutualiste
Boulogne-sur-Seine (Seine)/France

not later than March 31st, 1959.

IFAC NEWS

Membership

In addition to the 14 national organizations mentioned in Bulletin No. 1 and to the 4 national organizations listed in Bulletin No. 2, 2 new national organizations have joined IFAC:

19°) ISRAEL   Scientific Department of the Ministry of Defence of the State of Israel,
Hakirya, P.O. Box 7057, Tel-Aviv   £ 125

20°) FINLAND   Finnish Society of Automatic Control
c/o Dipl.-Ing. O. Ristaniemi,
Mannerheimintie 93, Helsinki   £ 125

Executive Council

At the kind invitation of the Italian National Research Council — which is the National Member Organization of IFAC for Italy — the next meeting of the Executive Council of IFAC will be held in Rome on March 4, 5, and 6, 1959. The meeting will be preceded by a meeting of the Advisory Committee on March 2, 3, and 4.

General Assembly of IFAC

In the course of a meeting of Mr. Harold Chestnut, President of IFAC, and Professor Letov, 1st Vice-President of IFAC, with Messrs. John Johnston, William Vannah and Albert Sperry at the Instrument Society of America Exhibition held in Philadelphia in September 1958, Mr. Johnston, Vice-President of I.S.A., kindly extended to IFAC an invitation to take advantage of the 1959 Annual Meeting of the Instrument Society of America for its own General Assembly.

This General Assembly of IFAC will therefore be held in Chicago from September 16 to 18, 1959, as provisionally agreed at the meeting of the Executive Council in March 1958.

In addition, IFAC will sponsor special sessions on instruments and transducers, while the I.S.A. Annual Meeting takes place in Chicago from September 23 to 25, 1959, for which it will

solicit papers on a world-wide basis and assume the responsibility for selection of those to be delivered at these special sessions.

The National Member Organizations of IFAC are requested to co-operate in obtaining papers for these special sessions. Prof. Dr. C.J.D.M. Verhagen, 12 Kanalstraat, Delft, Netherlands, will select the papers to be presented.

First International Congress of IFAC

Information concerning the First International Congress for Automatic Control was published in Bulletin No. 2 (September 1958). This Congress is to be held in Moscow from June 25th to July 5th, 1960 by invitation of the National Committee of the USSR for Automatic Control and with the co-operation of the National Member Organizations of IFAC.

Further information will be published shortly as a separate Pamphlet in the four official IFAC languages (English, French, German and Russian) for wide distribution by the Member Organizations of IFAC. The latter have been asked to inform Dr.-Ing. G. Ruppel, Secretary of IFAC, 79 Prinz-Georg-Strasse, Düsseldorf, Germany, of the number of copies they require and which official language. To each copy is attached a form to be completed by those wishing to attend the Congress or submit papers.

Anybody living in a country not represented in IFAC but interested in getting information about the Congress should write direct to the Secretary of IFAC (address given above).

The Moscow Congress of IFAC is expected to be a most important international event for scientists striving for the solution of scientific and technical problems in the field of automatics.

It is expected that the exchange of ideas will not only interest specialists concerned with the technical means of automatisation and with their application in industry but also all those who research on automatic systems and mathematical methods for their computation.

SURVEY OF TERMINOLOGY AND SYMBOLS
IN AUTOMATIC CONTROL

by Prof. Ed. Gerecke, Chairman of IFAC Nomenclature Committee

General Remarks

IFAC urgently wishes to standard terminology in the field of automatic control. It is especially desirable, that when the IFAC Congress meets in Moscow on June 25, 1960, accepted standard terminology and symbols will be used by all authors.

This field is divided into three sections:

    I   Terminology, Definitions.
    II   Letter Symbols.
    III Graphic Symbols.

These should be sufficiently general, that they can be used in the whole sphere of this science and its applications, also in analog and digital computers, in logical operations, in biology etc.

The following other organizations are working in this field:

I.S.O.   International Standards Organization
A.S.A.   American Standards Association
I.S.A.   Instrument Society of America
I.E.C.   International Electrotechnical Commission, Geneva, with National Committees in France, Germany, Italy, Switzerland, UK, USA, USSR, etc.
D.N.A.   Deutscher Normenausschuss
          (German Standards Committee)
V.D.I.   - V.D.E. Fachgruppe Regelungstechnik
          (Committee on Control)
B.S.I.   British Standards Institute

The titles of existing standards, proposed standards and other relevant publications, so far as is known to the author, are listed in a bibliography, pages 6 to 10 of this Bulletin in the languages, in which they have been published.

This bibliography is probably not complete and the author requests, that further relevant items may be brought to his attention.

IFAC desires that the use of standard terms in the field of automatic control be established as quickly as possible but does not wish to interfere in any way with the work that is being carried out by the aforementioned organizations. IFAC visualizes as its function the collection, comparison, co-ordination, completion and stimulation of this work. Because the science of measurements enters strongly into the science of automatic control, it must also be included.

Notes on the bibliography:
II.5 concerns some work which was begun in May 1958, by a group of American, German and Swiss mathematicians, dealing with the science of digital computation. A symbol-language has been created, which allows formulae and equations to be

represented in such a manner that they can be applied with-
out modification to digital computing machines. It has not
yet been published but may be obtained from Professor Stiefel,
ETH, Zurich/Switzerland, on application.

II.6 and II.7 concern letter symbols used in the electrical
sciences, which can obviously be used in the science of auto-
matic control.

III.1: The Section FK 3 (UK-R) of the Swiss Electrotechnical
Institution has been considerably occupied since May 1956,
with graphical symbols for automatic control. Their principal
work lies in the establishment of new categories in which the
symbols can be grouped, and in the choice of suitable basic
symbols. These categories are:

Basic symbols. - Mathematical operation symbols.
Combinations of basic symbols.
Symbols for storage (energy or information),
converters (energy or information) and amplifiers.
logical symbols.

Transfer symbols (defining exactly the relation
between output and input).

Block symbols. - Apparatus symbols.
Transfer circuit diagrams (Mathematical circuit diagrams).
Block diagrams. - Apparatus circuit diagrams.
Symbols for computing machines and data processing.

This most extensive compilation will be published in 1959.

List of Standards and of Publications on Standards

for Automatic Control

I. TERMINOLOGY

I.1 USA- General Electric
Regulating System Terminology

C.D. Beck. General Mill Engineering. Systems Application
Engineering Section. General Electric, Schenectady, N.Y.,
USA, 11-55 (2M). 7 pages.

I.2 USA- IRE

Proposed IRE Standard Terminology for Feedback Control Systems
IRE Transactions on Automatic Control.
PGAC- March 4th, 1958, Page 31, published by the Profes-
sionel Group on Automatic Control of the Institute of
Radio Engineers, Inc., 1 E 79th Street, New York 21,N.Y.,USA.

I.3 United Kingdom
Glossary of Terms used in Automatic Controlling and Regulating Systems

British Standards B.S. 1523. Section 1...5. British
Standards Institution, 2 Park Street, London, W.I.

I.4 International Electrotechnical Commission, IEC, TC 1
Automatic Control and Regulation Equipment

1(37)(Secretariat)263. Revision of the first edition
(1938) of the International
Electrotechnical Vocabulary -
Group 37: Automatic control
and regulation equipment.

1(40)(Central Office)218 Report on the Voting under the
Six Month Rule for the approval
of Document 1(40)(Secretariat)253.

1(37)(Finland)204 Comments of the Finnish National
Committee on Document 1(37)
(Secretariat)263.

1(37)(United Kingdom)242 Comments of the British Committee
on Document 1(37)(Secretariat)263.

1(37)(Netherlands)222 Comments of the Netherlands
National Committee on Document
1(37)(Secretariat)263.

1(37)(Belgique)32 Remarques du Comité Belge rela-
tives au document 1(37)(Secre-
tariat)263.

1(60)(France)224 Observations Françaises sur le
projet 1(60)(Secretariat)256.

I.5 Germany - DNA
Regelungstechnik

DIN 19226. Januar 1954. Benennungen und Begriffe. Arbeits-
ausschuss Regelungstechnik im Deutschen Normenausschuss.
Beuth-Vertrieb GmbH.; Berlin W 15 and Köln.
"DNA-Arbeit auf dem Gebiete der Regelungstechnik"
Regelungstechnik vol. 4(1956) p. 152.

I.6 Germany - NTG
Programmgesteuerte elektronische Rechenanlagen

Begriffe.
NTG 0601. Empfehlung 1957. Vornorm 1957.
Beuth-Vertrieb GmbH.; Berlin W 15, Uhlandstrasse 175 or
Köln, Friesenplatz 16.

I.7 Germany - U.C.P.T.E.

Union pour la Coordination de la Production et du Transport de l'Electricité. Terminologie de la Régulation en français, allemand, italien et hollandais. Editor: Deutsche Verbundesgesellschaft, Heidelberg/Germany.

I.8 Switzerland

Recommended Terminology for Automatic Control
SEV - ASE - 0208 1956 (in English, French or German) Swiss Electrotechnical Institution, Seefeldstrasse 301, Zurich 8.

I.9 Italy

Un tentativo di unificazione terminologica della regolazione automatica
Comitato Elettrotecnico Italiano - Sottocomitato No. 1 (Nomenclatura), Milano, 1956.

II. LETTER SYMBOLS

II.1 USA - ASA

American Standard Letter Symbols for Feedback Control Systems: ASA Y 10.13 - 195. July 1955, Subcommittee 14 on Feedback Control Systems of Sectional Committee Y 10 on Letter symbols.
Sponsor: American Society of Mechanical Engineers, ASME.
Collaborators: American Institute of Electrical Engineers. Institute of Radio Engineers. Instrument Society of America. Published by The American Society of Mechanical Engineers, December 15th, 1954.

II.2 Germany - DIN

Automatic Control, Symbols and Definitions.
DIN 19226, page 14/15, see I.5

II.3 Germany - NAMUR

Normenentwurf der NAMUR für die chemische Industrie
Presented in the book: Messen und Regeln in der chemischen Industrie (J.Hengstenberg, B. Sturm, O. Winkler), Publisher: Springer-Verlag 1957, page 162 to 167.

II.4 Switzerland

Besondere Liste von Buchstabensymbolen für die Regelungstechnik. (List of symbols for Automatic Control; in German)
Entwurf 25 (FK) 178. 8 pages. 20. September 1958. Fachkollegium FK 25 Buchstabensymbole und Zeichen. Unterkommission UK-R für Regelungstechnik des FK 25/CES. Schweizerischer Elektrotechnischer Verein, Seefeldstrasse 301, Zürich 8.

II.5 Switzerland

Proposals for General function symbols for digital computing. Professor Stiefel and collaborators, Institute for applied mathematics, Swiss Federal Institute of Technology, Zurich, Switzerland.

II.6 International Letter Symbols used in connection with Electricity. Third edition 1953 (in English or French)

International Electrotechnical Commission IEC. Published by the Central Office of the IEC, 39, Route de Malagnou, Geneva (Switzerland).

II.7 IEC - Switzerland

Règles et recommandations pour les symboles littéraux et les signes. (Rules and recommendations for letter symbols and signs; text available in French and German) Swiss Electrotechnical Institution, third edition.

III. GRAPHIC SYMBOLS

III.1 Switzerland

Graphische Symbole für die Regelungsautomatik und für das automatische Rechnen. (Graphic symbols for automatic control and automatic computation, available in French and German).
Schweizerisches Elektrotechnisches Komitee, CES. Unterkommission FK 3 (UK-R) für Regelungsautomatik und automatisches Rechnen. (Chairman: Prof. Ed. Gerecke). Schweizerischer Elektrotechnischer Verein, Seefeldstrasse 301, Zürich 8.

III.2 USA - MIT

Signal Flow Diagrams for Process Evaluation
Donald P. Campbell, Massachusetts Institute of Technology, Cambridge, Massachusetts/USA. Industrial and Engineering Chemistry, March 1955, page 409...412.

III.3 Germany - NAMUR

Same as II.3.

III.4 Germany - NAMUR

Zur Systematik der graphischen Symbole der Regelungstechnik und des automatischen Rechnens. (System of graphic symbols of automatic control and automatic computation)
By Ed. Gerecke, Zürich. Published in the book Regelungstechnik, moderne Theorien und ihre Verwertbarkeit, page 34...37. Heidelberger Tagung 1956. Publisher: R. Oldenbourg, München.

III.5 Strukturschaltbilder nichtlinearer Systeme
(Structural diagrams of non-linear systems)
By Ed. Gerecke, Zürich. Published in the book Rege-
lungstechnik, moderne Theorien und ihre Verwertbar-
keit, page 37...41. Heidelberger Tagung 1956.
Publisher: R. Oldenbourg, München.

NEWS FROM NATIONAL MEMBERS

Hungary

In Hungary, the working group was established in 1947 within
one of the oldest associations, the Hungarian Electrotechni-
cal Association, founded in 1901, which first dealt with
questions of Automatic Control and Instrumentation. The Scien-
tific Association for Measurements and Automatic Control (MATE)
was constituted in 1951 mainly of members of this working group.
Automatic Control as a branch of science is included in its
programme.

The monthly review "Mérés és Automatika" (Measurement and
Automatics) is a technical scientific publication of MATE.

The first National Conference on Automatic Control was organised
by MATE in 1955. The aim of this Conference was to make known
the state of the art in Hungary at that time and to point the
way to further development of automatic control in that country.
The second National Conference on Automatic Control took place
in 1957. This Congress emphasized industrial application of
Automatic Control as well as reporting results obtained up to
that time. The Association is organizing a National Congress on
Automatic Control every second year, the next taking place in 1959.

Besides the Association there are Automatic Control Research
Groups of the Hungarian Academy of Science working with the
Chair of Theory of Exploitation of Electric Machines and the
Chair of Special Electric Machines, both belonging to the Tech-
nical University of Budapest. These deal chiefly with questions
of Automatic Control of a theoretical character, the Hungarian
Measurements Research Institute dealing with process control,
transducers and instruments, and the Electric Research Insti-
tute with electric controllers.

On November 24 to 30, 1958, an International Measurements Con-
ference took place in Budapest. All problems arising in process
control and automation in relation to measurements and instru-
ments were discussed.

Norway

The Norwegian organisation of Automatic Control has now been
formed under the name "Norsk Forening for Automatisering (NFA)"
(Norwegian Society for Automation). This society is associated
with Den Norske Ingeniörforening and will have its office at

Kronprinsensgate 17, Oslo 9. The membership of IFAC has been
transferred from Den Norske Ingeniörforening to the Norwegian
Society for Automation on January 1st, 1959.

Director Egil Blakstad has been elected President of NFA, and
with him will serve as board members Mr. J.G. Balchen, Asso-
ciate Professor at the Norwegian Institute of Technology,
Mr. Asbjörn Barlaup, editor of the newspaper "Verdens Gang", and
also the engineers Mr. Eirik Samuelsen and Mr. Ibb Höivold.
Mr. Rolf Axelsen has been elected Honorary Secretary.

The Norwegian Council for Industrial Research has formed a
committee on Automatic Control that supports research projects,
mainly in the field of process control. A special committee for
control terminology has been appointed. Five so called automa-
tion groups, put up by different manufacturing companies, are at
work in the main cities, Oslo, Bergen, Trondheim and Stavanger.

Switzerland

On occasion of the 4th Symposium of ASPA (Association Suisse
pour l'Automatique) held in Zurich from December 2nd to 5th,
1958 (a report on which is published on page22), the General
Assembly of this Association has re-elected professor Ed. Gerecke
as Chairman and Dr. M. Cuénod as Honorary Secretary. This Asso-
ciation has at present more than 800 individual members and about
100 collective members.

United Kingdom

In Bulletin No. 1 the creation of Groups A and B of the
B.C.A.C. (British Conference on Automation and Computation)
was announced.

Group C - The British Group for the Sociological and
Economic Aspects of Automation Techniques
has now been formed with the participation of the following
seven organizations:

British Institute of Management - British Productivity
Council - Department of Scientific and Industrial Research -
Industrial Welfare Society - Institute of Cost and Works
Accountants - Institute of Personnel Management -
Institution of Production Engineers.

The Chairman of the Group is Sir Walter Puckey, M.I.Prod.E.,
F.B.I.M., and the Hon. Secretary is Mr. E. Moonman.

The General Committee of the B.C.A.C. has also been created,
Chairman Mr. T.E. Goldup, C.B.E., M.I.E.E., and Hon. Secretary
Mr. W.K. Brasher, C.B.E., M.A., M.I.E.E.

The first number of the B.C.A.C. Bulletin dated September /
October 1958 has been published. It contains valuable informa-
tion on forthcoming British and international meetings up to
the end of June 1959 and can be obtained from
The Institution of Mechanical Engineers
1, Birdcage Walk, Westminster, London S.W.1,
price 2 shillings per single copy or 12 shillings annual sub-
scription.

USA

American Automatic Control Council - AACC

The affiliated societies of AACC and their delegates and alternates for AACC are as follows:

American Society of Mechanical Engineers

Rufus Oldenburger (delegate), Purdue University,
Lafayette, Indiana

W.E. Vannah (alternate), Control Engineering,
New York, N.Y.

American Institute of Chemical Engineers

J.O. Hougen (delegate), Monsanto Chemical Co.
St. Louis, Missouri

D.M. Boyd (alternate), Universal Oil Products,
Des Plaines, Ill.

American Institute of Electrical Engineering

John Truxal (delegate), Polytechnic Institute
of Brooklyn, Brooklyn, N.Y.

R.M. Hutchinson (alternate), Brown Instrument
Division, Philadelphia, Pa.

Institute of Radio Engineers

John Lozier (delegate), Bell Telephone Labs.,
Whippany, N.J.

E.M. Grabbe (alternate), Ramo-Wooldridge Corp.,
Los Angeles, Cal.

Instrument Society of America

John Johnston, Jr. (delegate), E.I. du Pont de
Nemours, Newark, Del.

AACC is the US member of IFAC. The official address of AACC is:

American Automatic Control Council
c/o W.E. Vannah, Secretary,
330 West 42nd Street
N e w Y o r k, N.Y.

WORLDWIDE AUTOMATIC CONTROL

Austria

The ÖAA (Österreichischer Arbeitsausschuss für Automatisierung) has organized the following two lectures in Vienna.

On October 23, 1958, Mr. Rolf Weinreich of the Klöckner-Humboldt-Deutz in Köln spoke on "Consideration of the professional improvement of specialized workers in view of a gradual automatization".

On November 13, 1958, Mr. Rolf Basten of the Standard Elektrik Lorenz A.G. in Stuttgart devoted his lecture to "New developments in the field of data processing systems".

France

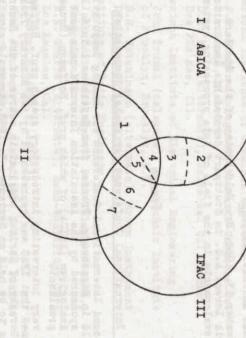### Second International Conference for Analog Computation

The Second International Conference for Analog Computation was held in Strasbourg, France, from September 1 to 6, 1958. It was sponsored by the Association Internationale pour le Calcul Analogique (AsICA) of which prof. Hoffmann (Brussels) is the president.

In his very interesting introductory speech prof. Hoffmann mentioned that IFAC was represented by its Honorary Treasurer prof. Gerecke of Zurich, and that in course of the General Meeting to be held on September 3, 1958, he would give him an opportunity of explaining the mutual relationship of AsICA and IFAC. Prof. Gerecke stated that a promising cooperation could be planned between AsICA and IFAC and showed, by means of a diagram. what fields of activity of the two organizations seemed to him to overlap (figure on page 14).

The circle (I) of this drawing encloses the whole field of Analog Computation Techniques, whilst the circle (II) encloses that of the Digital Computation Techniques. The circle (III) represents the field of Automatic Control. (I) should be re- presented on an international basis by AsICA and (III) by IFAC, whilst for (II) no international organization has yet been formed. The field 1, which is common to (I) and (II), covers Digital methods combined with Analog techniques which are for some computing purposes the most expedient because they give the results and all the intermediary values in the form of curves, if required on an oscillograph. On the other hand, Digital techniques can give much more accurate results. The combination of the two techniques was discussed at Stras- bourg at length and the present state of art was reported (Digital Differential Analyser - DDA).

The fields 2,3,4,5 cover the possible cooperation of AsICA and IFAC. Field 2 covers Analog Computers which use Automatic Control methods, whilst field 3 represents Automatic Control devices which comprise Analog Computers as a part. Fields 6 and 7 are those which involve both Automatic Control and digital computers. Thus field 6 represents those digital computers which employ automatic control techniques, while the control systems of field 7 employ digital computer techniques. Fields 4 and 5 include those systems which employ automatic control techniques as well as those of analog and digital computing.

Computation and Automatic Control.

I. Analog Computation Field
II. Digital Computation Field
III. Automatic Control Field

1. Digital-differential Analyser DDA
2. Analog computers using Automatic Control methods
3. Control systems using analog computing methods
4. Analog-digital combined computers using Automatic Control methods
5. Control systems using combined digital-analog computers
6. Digital computers using Automatic Control methods
7. Control systems using digital computing methods

The present development of new techniques in both Computation and Automatic Control is partly accomplished within the field in which the three circles (I), (II) and (III) overlap and requires the construction of "converters" such as Analog-to-Digital converters, Digital-to-Analog Converters, decoders and analogue as well as digitally operated transmitters. Later sampling methods and sampling theory will be required in this connection.

Another field of interest to both organizations may be the standardization of nomenclature and of written and graphic symbols. Should IFAC find an internationally acceptable solution, taking into consideration the views of existing national and international organizations, it would submit such a proposal to AsICA.

The cooperation of the two international organizations could be visualized as keeping one another informed on forthcoming conferences, to which delegates may be sent, and also on all other relevant events and publications. To avoid the risk of international meetings interfering with one another AsICA and IFAC might agree on the following approximate time schedule for their major congresses: AsICA 1961, 1964, 1967; IFAC 1960, 1963, 1966... (Ed. Gerecke)

International Conference on Digital Data Processing, June 1959

An international conference on Digital Data Processing will be held in Paris from June 15 to 20, 1959 under the auspices of UNESCO.

This conference will be divided into 6 main sections:

1. Digital computation methods
2. Logical design of computers
3. Common symbolic language for digital computers
4. Automatic translation of languages
5. Data collection, conservation and research
6. Character recognition and learning of the computer

The discussion of some 66 papers is visualized in the course of meetings lasting 3 hours each. Some symposia on special items will take place during the conference; their subjects will be published later. An International Computer Exhibition will take place in Paris at the same time and visits to manufacturers and computing laboratories are provided for.

Authors are urgently requested to submit abstracts of about 250 words in English or French in five copies to their specialized national groups. Participation of individuals in this Conference is to be notified either to these specialized national groups or, for countries not provided with such groups, directly to the

Conference on Digital Data Processing
c/o UNESCO (Department of Natural Sciences)
19, avenue Kléber, Paris 16, France.

Preprints in English or French will be distributed to all persons taking part in this Conference before it starts.

Germany

Open and Closed Loop Control in Electric Drives

A meeting on this topic was organized by the German VDI/VDE-Fachgruppe Regelungstechnik from 15 to 17 October at Aachen under the chairmanship of Prof. O. Mohr, Berlin. It was the aim of the meeting to inform specialists from works apply-ing controlled drives about the operation of such systems.

750 engineers attended the meeting and their interest proved the great need of detailed information on the basic principles of automatic control systems. After the opening speech, which particularly clarified the principal definitions in order to secure uniform terms in this special field, the application of controlled drives in rolling mills, in paper machines, textile machines and machines for plastics etc. was explained. Some further papers dealt with new structural elements, as for instance with the application of transistors. The papers of the meeting will be printed in a book to be published by the VDE-Verlag, Berlin.

Automatic Control in Living Organisms

A second meeting organized by the VDI/VDE-Fachgruppe Rege-lungstechnik together with the International Association of Cybernetics (President: Prof. G. Boulanger, Namur) took place at Essen on November 6 and 7 under the chairmanship of Prof. O. Schäfer (Aachen). As can be seen from the title "Automatic Control in Living Organisms", fundamentally new problems were to be discussed. Well-known biologists, physio-logists and physicians were invited to report on their in-vestigations on living organisms with particular reference to where automatic control occurs and what is known of the nature of these automatic control systems. On the part of the engineers, a paper presented by Dr. H. Zemanek (Vienna) on "Technological and Biological Models" gave a detailed account of problems encountered in the construction of models. In a noteworthy opening speech the physiologist Prof. von Holst (Munich) made some critical remarks on the application of automatic control theory to biology. He drew the attention to the limitations set by searching for closed loop controls in living organisms pointing out that they are very complicated systems containing elements, the functions of which cannot be judged from a control engineering point-of-view. The author also pointed out that automatic control in living organisms need not always be optimum, but are at all times dependent on the peculiarities of their biological evolution.

Although all papers were worthy of mention, space permits reference only to two groups of papers, namely those of Dr. Couffignal (Paris) and Dr. Ashby (Gloucester/U.K.), contri-buted by the International Association of Cybernetics, and of three papers on the analysis of a biologically dependent speed measuring system in a weevil. This subject was treated by three experts, one working in the field of biology, one in

the field of theoretical physics and the third in the field of applied physics. All three are cooperating in a labora-tory for cybernetics of the Max-Planck-Society, and each has investigated this automatic control system in his particular way, the theoretical physicist using statistical methods and the applied physicist an analogue computer.

These papers stimulated a most lively discussion. The papers of this meeting will be published as an appendix to "Rege-lungstechnik", published by R. Oldenbourg, Munich.

Activities of the Committees of the VDI/VDE-Fachgruppe Regelungstechnik

The German VDI/VDE-Fachgruppe Regelungstechnik has established 14 Committees on Automatic Control divided into three Sections. One Section deals primarily with organizational and literary matters, such as documentation, questions in connection with the patent office and education. The second Section deals with the application of automatic control, namely the control of steam generators, of the supply of electric energy, of machines, power generators, and of reactors. The third Section deals with the theory of instrumentation in all fields of application, and includes the Committees on rules for acceptance tests of con-trol apparatus, on the technology of control apparatus, on the application of theoretical methods, on cybernetics as well as on data processing in automatic control.

The producers and users of instruments as well as the sciences and authorities are represented on these Committees.

The first report will be published shortly by the Committee on patent handling. The Committee is undertaking two tasks:

1. to draft a scheme for the subdivision of the Section "Open and Closed Loop Control" of the International Patent Classification;

2. to draw up the patent classes of the German Patent Classification as far as automatic control and related fields are concerned.

The first will be published as a basis for discussion in one of the forthcoming issues of "Regelungstechnik".

The second item originated from the need for a survey of auto-matic control patents actually granted which, in Germany, have until now been mainly classified according to particular fields of application. Thus the patents are scattered all over many different patent classes.

Further reports are expected to be published during 1959 by the Committee dealing with the control of steam generators. This Committee is particularly concerned with rules for the design of the water-level control in boiler drums. The Com-mittee dealing with acceptance tests of control apparatus will also submit proposals for acceptance tests of pneumatic standard controllers before long.

Italy

The Provisional International Computation Centre, Palazzo degli Uffici in Rome is organizing a "Symposium on the numerical treatment of partial differential equations with real characteristics" to be held in Rome, January, 28 to 30, 1959.

In October 1958 this Computation Centre which is established by the United Nations, UNESCO, and the Italian Institution for High Mathematics has issued its Bulletin No. 2/3. Besides other items, this Bulletin includes a list of Computation Laboratories in 13 countries.

Spain

International Congress on Automatic Control

An international congress on automatic control was held in Madrid under the name of "Congreso Internacional de Automatica" from October 13 to 18, 1958; it was organized by the Instituto de Electricidad y Automatica of Madrid and its very active Director, Professor J.G. Santesmases.

The opening session of the Congress took place on October 13, 1958 in the National Institute of Prevision under the chairmanship of Mr. Suanzes, President of the National Institute of Industry.

Speeches were delivered in Spanish by Lt.General Leslie R. Groves (U.S.A.), professor Vieweg (Germany), professor Santesmases, professor Broida, 2nd Vice-President of IFAC, and President Suanzes, Chairman of the Congress.

Speaking on behalf of IFAC, professor Broida said that IFAC hoped in the near future to welcome Spain as a member of IFAC. He then stressed the intention of the members of IFAC not only to relieve the burden of organising international congresses for host countries but also to restrict the number of such congresses in order to increase their interest and it was hoped to give them a broader international basis. In this way it was hoped to avoid waste of time and effort on the part of both the organizers and those who take part. He expressed his confidence in the future achievements of Spanish control engineers who, after having succeeded alone, will certainly succeed still better in close and friendly co-operation with their colleagues of the various nations having already joined IFAC.

In the afternoon of October 13, under the presidence of Dr. Russ (U.S.A.), 5 papers were read on:

"Pneumatic and hydraulic servomechanisms and switching devices" by professor Broida (France)
"Aspects of development of Automatic Control in Belgium" by professor Hoffmann (Belgium)
"Two-variable function generator" by Dr. Ibeas (Spain)
"The application of trial and error learning methods to Automatic Control" by Dr. Uttley (United Kingdom)
"Study of the stability of the Automatic Control System of the Moncloa pool type reactor" by Messrs. Montero Ponce de Leon and de la Pezuela Pinto (Spain)

Three sessions took place on October 14. The first one, presided by Dr. Wilkes (United Kingdom) comprised 4 papers:

"Digital computers in Switzerland" by professor Stiefel (Switzerland)
"Development and application of the Göttingen electronic computers" by professor Bierman (Germany)
"The recent developments of electronic computers in Japan" by professor Yamashita (Japan)
"The Danish Institute for Computing Machinery" by Dr. Bech (Denmark)

The second session presided by professor Svoboda (Czechoslovakia) comprised 4 papers:

"Switching transformation" by Dr. Semon (U.S.A.)
"A matrix theory of logical systems" by Dr. Sanchez Rodriguez (Spain)
"On discontinuity risks in sequential commutation circuits" by Colonel Naslin (France)
"Logical algebra and matrix method incorporated in a draft of bivalent element circuits" by L. Caceres (Spain)

The third session of October 14 was presided by professor Howard Aiken (U.S.A.); it comprised 5 papers:

"The design of the new M-2 computer" by Dr. Booth (United Kingdom)
"IBM 7070 in Data Processing" by Mr. Stautner
"Auxiliary storage on magnetic tape in EDSAC 2" by Dr. Wilkes (United Kingdom)
"Computer for field problems" by Dr. Zuse (Germany)
"The simultaneous processing of distinctive data on a single computer. Logical structure and programmation of Gamma 60" by Dr.-Ing. Dreyfus (France)

On October 15, three more sessions took place. The first one was presided over by prof. Sarda (Spain) and 4 papers were devoted to economic and human problems associated with Automatic Control:

"Techniques and Automatic Control as human problems" by professor Viewes (Germany)

"Automatic Control and Economy" by professor Estapé (Spain)

"Remarks on the economic development of Automatic Control" by Mr. Touly (France)

"Automatic Control and Economy" by professor Fuentes Quintana (Spain)

The second session was held under the presidence of Mr. Auguet (Spain); 5 papers were presented as follows:

"A numerical control unit for machine tools with application to a flame-cutter" by Mr. Hysing (Norway)

"Numerically controlled machine-tools in Japan" by Dr. Sugimoto (Japan)

"A new development of electronics in machine-tools" by Mr. Touly (France) followed by a film

"A digital servomechanism applies to the numerical control of machine-tools" by professor Oshima (Japan)

"The application of Parametron to the numerical control of machine-tools" by Mr. Sajiki (Japan)

The third session of October 15, presided over by Dr. Booth (United Kingdom) comprised 3 papers:

"Ferroresonante computation circuits" by Dr. Alique (Spain)

"Ferroresonante switching circuits" by Dr. Proebster (Switzerland)

"Some possibilities of ferroresonante circuits" by Dr. Civit Breu (Spain)

The first session of the three held on October 16 was presided over by prof. Santesmases (Spain) and 3 papers were read on:

"Some aspects of sequential circuits using magnetic cores" by professor Caldwell (U.S.A.)

"The study of electric networks containing inductors with rectangular hysteresis loop and finite switching time cores" by professor Dadda (Italy)

"Static magnetic memory with non-destructive reading applied to an automatic programmer of traffic" by Mr. Ferrate (Spain)

The second session was presided over by prof. Alwin Walther (Germany); 3 papers were devoted to:

"A contribution to the theory of unreliable logical networks" by Dr.-Ing. Zemanek (Austria)

"Graphical computation of binary variable functions" by Mr. Soubiés-Camy (France)

"Method of matrix tables for simplifying commutation circuits" by Dr. Sanchez Rodriguez (Spain)

5 papers were read at the third session of October 16, presided over by prof. Hoffmann (Belgium); they were the following:

"A new perturbation method for the stability analysis of the non-linear filtrated systems" by professor Belevitch (Belgium)

"Automatisation of radio-communications between moving objects" by Mr. Gonzalez del Valle (Spain)

"Thermistor circuit theory" by professor Ekelof (Sweden)

"The role of the repetitive electronic differential analyser" by Dr.-Ing. Tomovich (Yougoslavia)

"A rectangular-to-polar coordinates transformer" by Mr. Aleixandre Campos (Spain)

The first session of October 17 was held under the presidence of professor Broida (France) and 4 papers were read on:

"Computers and documentation" by Dr. Kent (U.S.A.) followed by a film

"Modern automation in industrial concerns" by Dr. Adam (Austria)

"Automation and future management information systems" by Dr. Alexander (U.S.A.)

"The sources in correction of errors in data transmission systems" by Dr. Wright and Mr. Terry (United Kingdom)

The second session was presided over by prof. Marino (Italy) and 5 papers were read on:

"Means of control in the Automatic Data Processing" by Dr. Linsman (Belgium)

"Naval ordnance data automation center" by Mr. Tillitt (U.S.A.)

"Examples and general aspects of the automation of calculations" by professor Alwin Walther (Germany)

"The residue number system in mathematical machines" by professor Svoboda (Czechoslavakia)

"Some questions on the binary arithmetic of serial computers" by Dr.-Ing. Vacca (Italy)

The last working session held on October 17 was presided over by General Nicolau (France); 3 papers were devoted to:

"Possibilities and limits of modern automatic machines" by professor Boulanger (Belgium)

"Structures and machines" by professor Kurepa (Yugoslavia)

"Transistorized information handling systems" by Mr. Zschekel (United Kingdom)

The closing session was held in the National Institute of Prevision under the presidence of Mr. Suanzes; greetings and thanks were given to the organizers of the Congress by French, British, German, Japanese, and Italian speakers and, after a speech by Lt.-General Leslie R. Groves (U.S.A.) and a very interesting and detailed report by professor Howard Aiken (U.S.A.) on the results of the Congress, President Suanzes delivered his closing speech.

As can be seen from the information given above, this Congress, whilst bearing the name of "Congreso Internacional de Automatica" was in fact mostly devoted to computer (and, more particularly, to digital computer) techniques and only partly to Automatic Control, namely the use of the computer techniques for control purposes. Other questions of Automatic Control were included only as a minor part of the programme of this Congress.

Switzerland

The 4th Symposium of ASPA

The ASPA (Association Suisse pour l'Automatique) has organized from December 2 to 5, 1958 in Zurich its 4th Symposium, which was attended by more than 800 persons. Under the presidence of professor Profos, 4 papers were read on Automatic Control of boilers.

"The use of analog devices for handling control problems in heat exchangers" by Dipl.-Ing. Leo Acklin

"The transfer behaviour of boiler water pre-heaters and its influence on the feed control of drum boilers" by Dipl.-Ing. Schunk

"The control of Sulzer Once-Through Boilers for over-critical steam pressure" by Dipl.-Ing. Gerber

"Control research on Velox boilers" by Dipl.-Ing. Arthur Oberle

3 papers were given on Automatic Control of steam and gas turbines including

"Control problems in steam turbines with intermediary superheating installations" by Dipl.-Ing. Kurt Wirz

"Control dynamics of an open Sulzer High Furnace gas turbine" by Dipl.-Ing. Ed. Müller

"The control of blowers feeding converters through long pipes" by Dr. Boninsegni

A session devoted to Automatic Control in heating and ventilating techniques was presided over by Dr. Weber; 6 papers were read including

"Control problems in Air Conditioning techniques" by Director Karl Sauter

"Special control problems in industrial heating" by Dipl.-Ing. Wilhelm Wirz

"The room as a controlled system" by Dipl.-Ing. Karl Wuhrmann

"Pneumatic controllers for Air Conditioning techniques" by Dipl.-Ing. Junker

"Electric controllers for Air Conditioning techniques" by Dipl.-Ing. Spühler

"Control accuracy with Air Conditioning Automatic Control" by Dipl.-Ing. Junker

Another session was entirely devoted to digitally and electronically controlled machine-tools and was presided over by professor Ed. Gerecke; 8 papers in this field were presented.

"Digitally controlled contour machine-tools" by professor Ed. Gerecke

"Economic and electronic problems concerned with the automatisation of pointing machines" by Mr. André Mottu

"A differential analyser using Cold Cathode tubes" by Dipl.-Ing. Vollenweider

"Electronic analog-to-digital converter" by Mr. Troost

"Digital Position Control and Order Transmission for machine-tools" by Dipl.-Ing. Stosberg

"Coordinate stamping machine" by Mr. Buser

"Example of a shaping machine control with digital simulation of the table travel and determination of the modification point" by Dipl.-Ing. Bolliger

"A quadratic interpolator with digital input and analog output" by Dr. Th. Brisman

The last session, also presided over by professor Ed. Gerecke, included 9 papers on electronic control of motion in industrial processes.

"The characteristics and the mathematical picture of motorized motions" by professor Ed. Gerecke

"Control operation of reversal motions" by Dipl.-Ing. Hans Rudolf Bill

"Research on Ward-Leonhard Controls with an analog device" by Mr. Hansruedi Bühler

"Calculation of the control characteristics and of the form factors with rectifier-fed anchor motions" by Dipl.-Ing. Ivan Földi

"Examples of motorized control systems with non-linear elements" by Dipl.-Ing. Rainer Schraivogel

"Variable-speed motion using a synchronous motor connected to a static frequency converter" by Mr. Broniewsky

"A photo-electric coincidence method for phase-synchronized control of low-voltage machines" by Dipl.-Ing. H. Schwartz

"Automatic control of electric starting and braking of a locomotive by means of a transducer" by Mr. Raymond Germanier

"The Fahrdiagraph" by Dr.-Ing. Fred Hänni

The two next symposia will take place in the spring of 1959 in Lausanne and in the autumn of 1959 in Zurich. The first will be devoted to some mathematical aspects of the study of Automatic Control problems; the second will cover some industrial applications of Automatic Control.

Activities of the Geneva Section of ASPA in 1958 - 1959

The programme of the Geneva Section of ASPA includes the following lectures and symposia:

1. 16 lectures on Operational Research by Dr. A. Kaufmann (France) running from October 1958 to June 1959.

2. 3 lectures on digital computers by Mr. Jean-Paul Boss (France) and on social aspects of automation by Mr. Hervey de Bivorth.

3. 4 symposia:
"Modern trends in control systems"
"Digital computer practice"
"Analogue computer practice"
"Introduction to office automation"

All inquiries concerning these symposia should be directed to

Mr. J.-Ph. Pahud,
Battelle Institute,
7, route de Drize,
Geneva, Switzerland

United Kingdom

The following coming events are announced by the B.C.A.C. (British Conference on Automation and Computation):

1. Wednesday, 4th February - Wednesday, 18th March, 1959

"Electronics in Banking"

A course of seven lectures organized by The Institute of Bankers to be given in the library of the Institute, 10 Lombard Street, London, E.C.3. at 6.30 p.m. commencing 4th February, 1959, and thereafter on successive Wednesdays until 18th March, 1959.

2. Monday, 16th and Tuesday, 17th February, 1959

"New Digital Computer Techniques"

Specialist Discussion Meetings organized by The Institution of Electrical Engineers at which the electrical engineering aspects of digital computers will be discussed informally. The four sessions, each of which will consist of an opening lecture by an authority on the aspect concerned, a series of selected contributions, and a general discussion on the subject matter of the particular session, are provisionally scheduled as follows:

Session I: Character Recognition

Session II: Peripheral Equipment (Magnetic tape, paper tape, fast printers, and other forms of input and output devices; and problems arising in their attachment to digital computers).

Session III: Low temperature storage and switching devices.

Session IV: Special aspects of logical design, for example logical circuit techniques, fast carry logic for adders; interrupt facilities, and the relation of logical design to reliability.

Particulars, including registration forms (a fee is payable by non-members), available from the Secretary, The Institution of Electrical Engineers, Savoy Place, London, W.C.2.

3. April 1959

"Teaching the Fundamentals of Automatic Control"

The Institution of Mechanical Engineers is arranging a two-day residential conference to assist in mastering the fundamental ideas of Automatic Control. It is also intended to provoke further thought on the influence which control theory and related topics should have on the education of mechanical engineers, and, more particularly, on the teaching of applied mechanics and mechanics of machines. The object of this meeting will be, primarily, to instruct those who are new to the subject.

The technical meetings will be held at the Cambridge University Engineering Laboratory, and residential accommodation will be arranged in one of the colleges. Membership will be restricted to those engaged in teaching, and each University and College of Advanced Technology in Great Britain will be invited to send representatives. Further details will be published later.

4. Monday, 11th to Wednesday, 13th May, 1959

"Instrumentation and Computation in Process Development and Plant Design"

Joint symposium organized by The Institution of Chemical Engineers, the Society of Instrument Technology and the British Computer Society to be held at the Central Hall, Westminster, London, S.W.1. The provisional programme including 5 sessions is as follows:

Improving the Efficiency of Existing Processes

"Statistical considerations in process optimisation"
by G.A. Coutie

"Correlation analysis of a heat exchanger"
by J.J. Florentin, B.D. Hainsworth, J.B. Reswick and J.H. Westcott

"A system for the control of volume balance and chemical composition of a process solution and a check on the design of the equipment using an analogue computer" by D.C.F. Pratt and E. Muller

"Superfractionator controllability data obtained by the use of a digital computer" by J.M. Keating and D.S. Townend

The Design of New Processes

"Use of electrical analogues in the study of the dynamic behaviour and the control of distillation columns" by J.E. Rijnsdorp and A. Maarleveld

"The design of dual temperature exchange processes for the production of deuterium"
by C.J. Lyon and J. Howlett

"An application of analogue computing to cost estimation for processes, plant, and control systems"
by D.W. Gillings

"The control of axial-flow compressors: the establishment of a control loop to meet unusual performance specifications" by J.E. Samson

"Heat exchanger analysis using a medium size computer"
by P.V. Slee

The Application of On-line Computers

"A digital computer for multiple shaft speed regulation" by M.W. Sage

"A data processing machine for nuclear furnace protection" by J. Churchill and R.S. Hopkins

"The use of simple computers in electronic process control loops" by R.J. Redding

"The application of new techniques of control and information handling to rolling mills" by W.N. Jenkins

Recent Developments in Instruments, On-line Computers, and Computers for Design

"Ratio flow controller for in-line blending"
by H.H. Idzerda

"Non-destructive analysis as an automatic monitoring technique in ore refining and similar processes"

"The use of a computer to handle data from a pilot plant" by H.H. Rosenbrock

"The application of analogue computer techniques to process design, with particular reference to frequency response analysis of plant behaviour" by D.L. Davies

The Use of Computer Techniques in Large and Small Companies

"Process development and plant design in large and small companies with particular reference to instrumentation and computation" by S.T. Lunt

"The organisation of a computer aided design department"
by R.W.H. Sargent

Details should be asked from the Secretary, The Institution of Chemical Engineers, 16 Belgrave Square, S.W.1., not later than 30th January, 1959.

5. Monday, 22nd to Thursday, 25th June, 1959

First Conference of the British Computer Society

to be held in Cambridge. It is intended that the programme will include papers and symposia on:

"The UNESCO Conference"; "The state of the art"; "Selection and training of programmers"; "Production control"; "Operational research"; "Automatic programming"; "Logical design"; "Numerical analysis"; "Auditing problems"; "Experiences with the use of magnetic tape".

Details from the Secretary, British Computer Society, Finsbury Court, Finsbury Pavement, London E.C.2.

USA

The American Institute of Electrical Engineers meetings

The A.I.E.E. Autumn meeting was held in Pittsburgh, Pennsylvania, in October 1958. Sessions were scheduled on:

1. Theory and Practice of Feedback Control to the Control of Nuclear Reactors

2. Automatic Feedback Control Systems as Applied to the Steel Industry

We are still lacking further particulars on this meeting.

In what the A.I.E.E. Summer meeting is concerned, it was held in Buffalo, New-York, from June 22nd to 27th, 1958; the following panel discussions and sessions and the following papers seem to be of special interest (the numbers indicate the papers available):

1. Panel Discussion on Problems in the control and Instrumentation of Space Vehicles, Satellites and Missiles (7 papers)

"The celestial mechanics of space flight. Physical attributes and variables of control" by Dr. Levitt

"Control and instrumentation problems associated with the guidance of space vehicles" by Dr. Stark Draper

"Problems of dynamic stabilization in large rocket vehicles" by Richard Hanna

"Instrumentation requirements for altitude control of satellites and space vehicles" by James Farrior

"Inertial control of satellite altitude" by Dr. Roberson

"Instrumentation of altitude control of satellites and interplanetary vehicles" by E.V.B. Sterns

"Component and system design for minimum weight and volume, maximum accuracy and reliability" by Jack Bowers

2. Sampled Data Control Systems (5 papers)

58-770 "Staggered sampling to improve stability of multiple sampler feedback systems" by R.E. Andeen

58-801 "Analysis of sampled-data feedback control systems with finite sampling duration" by J. Tou

58-802 "A technique for the time domain synthesis of sampled-data systems" by H.C. Torng

58-803 "Analysis of cyclic rate sampled data feedback control systems" by R.E. Hufnagel

"Transistor circuits for an error-sampled control system" by C.H. Knapp, E. Shapiro, R.A. Thorpe

3. Hardware and Design of Feedback Control Systems (5 papers)

58-796 "Transfer functions of loaded synchronous machine" by Hamdi Sepen (Turkey)

58-797 "Synthesis of control systems based on an approximation to a third-order system" by C.R. Hausenbauer and G.V. Iago

58-798 "A 6-watt transistor servo amplifier for operation from -55°C to +125°C" by V. Vartanian

58-799 "Linear rate generator" by L.F. Stauder

58-800 "The design of Analog Computer compensated control systems" by S.C. Bigelow

4. Non-linear Feedback Control Systems (7 papers)

58-804 "On the non-existence of finite-stage zeroing procedures for certain systems with on-off controls" by B.A. Fleishman and B. Friedman

58-860 "Graphical analysis and synthesis of feedback control systems" Part 1 - Theory and Analysis, by D. Mitrovic (Yugoslavia)

58-861 "Graphical analysis and synthesis of feedback control systems" Part 2 - Synthesis, by D. Mitrovic

58-862 "Graphical analysis and synthesis of feedback control systems" Part 3 - Sampled-data feedback control systems by D. Mitrovic

58-852 "Multi-variable control systems synthesis" by R.J. Kavanagh (Canada)

58-894 "A novel and simple non-linearized control system" by J. Zaborsky

58-895 "Frequency response of non-linear closed-loop feedback control systems" by S.L. Mikhail and G.H. Felt

The Wescon 1958 Convention

The West Coast Convention conference and exhibit was held in Los Angeles from August 19 to 22, 1958. The expected figure of 30.000 engineers was somewhat pessimistic, as exactly 33.223 engineers attended this conference and exhibit, where more than 700 exhibitors displayed their products.

As to the conference itself, special mention should be made of the session on human factors in engineering with papers by H.P. Birmingham and H.D. Irvin on man-machine control systems, of papers on checkout testing such as those by D.R. Proctor and J.I. Davis and to the Automatic Control session sponsored by the Institute of Radio Engineers.

The latter comprised the following 5 papers (to be published in the I.R.E. - Wescon Convention Record):

"Compensation of multi-loop control systems" by Don Iebell and Max Mandell

"Optimization of compensation for cascaded actuators in a common feedback loop" by George Axelby and Eugene Osborne

"Some simplifying additions to basic sampled-data Theory" by Carl Carlson

"Contributions to the analysis of non-linear feedback control systems" by S.L. Mikhail

"Enhanced real time data accuracy for instrumentation radars by use of digital hydraulic servos" by R.P. Cheetham and W.A. Mulle

The Instruments Society of America 1958 Annual Meeting

The 13th Annual Instrument-Automation Conference and Exhibit was held by the I.S.A. in Philadelphia from September 14 to 19, 1958.

The lectures comprised, on September 14th and 15th, a general course on instrument calibration and checking techniques and equipment followed by 5 application options referring respectively to metal industry, ceramic industry, power plants, chemical industry and petroleum industry.

On September 18th lectures were given on basic instructions covering both analog and digital computers and separately on applications of either analog or digital computers.

At the end of the conference, four Russian control engineers spoke on the following items:

Mr. A.M. Petrovsky
- on a new utility telemetry system using delta modulation

Professor A.M. Letov
- on mathematical techniques for determining stability of non-linear systems
1st Vice-President of IFAC

Mr. A.B. Chelutskin
- on gaging systems for the steel industry

Mr. B.N. Naoumov
- on results of analytical work in computing control

These lectures were completed, on the American side, by a report of Messrs. William Vannah, Secretary of the American Automatic Control Council, Cohn and Sprague on the visit of 13 American control engineers to the USSR.

As to the exhibit, it was mainly characterized by a strong trend of manufacturers to build new electronic controllers, electric servo-motors and control computers for process control, this trend to an increase of electronic process control, not resulting, however, in obsoleting pneumatic process control.

It must be stated in this respect that, whilst during the past 7 years only two important American firms manufactured entirely electronic process control systems, the 1958 ISA Exhibit suddenly showed new similar devices manufactured by four other very important American firms having entirely devoted up to then their activity to pneumatic process control and that two more well-known American firms are expected to enter shortly the electronic process control field.

Special purpose computers for process control have also made their apparition in this exhibit and one of the manufacturers of recorder-controllers has provided (apart from the two conventional pointers corresponding respectively to the indicated value and to the hand-set desired value) a third pointer automatically set from a computer signal in order to indicate the set-point calculated to be optimum.

An increased number of electric servo-motors and automatic valves was shown at the 1958 ISA Exhibit to match the increase of that of electronic process controllers and the apparition of process computers. This seems to confirm the general trend in the U.S.A. towards electronic process control with however this restriction that the latter will have its proper - and probably, enlarged - place in Process Control, pneumatic process control continuing to have its own place and combinations of both techniques being likely to be of great interest.

International Systems Meeting

The Systems and Procedures Association of America held an International Systems Meeting in Pittsburgh, Pennsylvania, on October 13, 14 and 15, 1958.

Amongst the different papers read, the following cover fields of interest to Control Engineers:

"The operating characteristics of a highly automatic factory" by James Bright (USA)

"The development and operation of an existing totally integrated systems" by Dr. Robert Rosenkranz (Germany)

"Appraisal of electronic data processing" by John Diebold (USA)

"Computer trends in systems work" by Dr. Alan Perles (USA)

"The development and operation of an existing totally integrated system" by Georg Reinicke (Germany)

"Operations research in systems work" by Dr. Herbert Galliher (USA)

Further particulars can be obtained from:

Mr. A.M. Motter, Vice-Chairman of the Systems and Procedures Association of America c/o Jones & Laughlin Steel Corporation 3 Gateway Center Pittsburgh 30, Pennsylvania

Yugoslavia

The Yugoslavian Seminary for Control, Measurement and Automation (JUREMA - Jugoslavenski Seminar za Regulaciju, Mjerenje i Automaciju) at Zagreb, Fabkovićeva Ul. 1, plans to organize an exhibition as part of the Zagreb International Fair and a Conference on Measurement and Control to be held in Autumn 1959. Yugoslavian as well as foreign firms and scientists are invited to exhibit or to read papers. The Zagreb International Fair will celebrate the 50th anniversary of its activity.

PUBLICATIONS

France and Belgium

"Technologie et Calcul Pratique des Systèmes Asservis" by P. Naslin, 448 pages, 482 figures, 3600 French francs, published by Dunod, Paris, 1958.

"Circuits à Relais et Automatismes à Séquences" by P. Naslin, 229 pages. Published by Dunod, Paris, 1958.

The Proceedings of the International Congress of Automatics (Congrès International de l'Automatique) held in Paris (France) from June 18 to 24, 1956 will be published in Belgium.

Subscriptions should be sent to the publisher:
Les Presses Académiques Européennes
98 chaussée de Charleroi
Bruxelles (Belgium)

at a rate of 800 Belgian francs per copy.

Germany

"Fundamentals of Automatic Control" by Prof. Dr. V.V. Solodovnikov. German translation from Russian under the direction of Prof. Dr. H. Kindler. Published by R. Oldenbourg Verlag, München, 1958 and Verlag Technik, Berlin 1958.

Volume I   General basis of linearized automatic control systems theory, 727 pages, 460 figures, 23 tables, price 65 DM.

Volume II   Some problems of the non-linear Control systems theory, 435 pages, 233 figures, 3 tables, 52 DM.

"Interkama 1957"

Papers presented at the International Congress and Exhibit of Measuring techniques and Automatic Control in Düsseldorf, 1957. Published by R. Oldenbourg Verlag, München, 1958. 401 pages, 379 figures, 11 tables, 48 DM.

A. Opening lectures and introductory papers of the Congress on fundamentals of Measurement and Automatisation with papers of R. Vieweg, H. König, W. Gerlach, M. Jacob, H.E. Linckh.

B. Further main papers of the Congress on different fields of application of Automatic Control to industry, energy supply and exploitation.

C. Electrical and heating measuring instruments and measuring procedures.

D. Controllers and control procedures of the information techniques.

E. Power control of steam generators for compound operation.

F. Discontinuous Automatic Control.

"Course of automatic Control"
("Lehrgang der Regelungstechnik")
by J.C. Gille, M. Pelegrin and P. Decaulne; translated from French into German by Dipl.-Ing. Felix Kracht. To be published in 1959 by R. Oldenbourg Verlag, München. Approximately 400 pages and 600 figures.

"Relay systems theory of Automatic Control"
("Theorie der Relaissysteme der automatischen Regelung")
by Prof. Dr. J.Z. Zypkin, translated from Russian into German. Published by R. Oldenbourg Verlag, München, 1958. and Verlag Technik, Berlin 1958. 472 pages, 249 figures, 17 tables, 52 DM.

"Dynamic conditions in linear systems of Information and Automatic Control"
("Dynamische Vorgänge in linearen Systemen")
by Dr. H. Kaufmann. To be published by R. Oldenbourg Verlag, München.

"Application of Computers for the Computation of Control Processes"
("Anwendung von Rechenmaschinen bei der Berechnung von Regelvorgängen")
Papers of a meeting of the Committee for Mathematic Methods in Automatic Control of the GAMM (Society for Applied Mathematics and Mechanics). Compiled by Prof. W. Oppelt. Published by R. Oldenbourg, München, 1958. 128 pages, 16 DM.

"Pneumatic Controllers"
("Pneumatische Regler")
by Dr. F. Kretzschmer. Published by VDI-Verlag, Düsseldorf, 1958. 156 pages. 26.80 DM

"Open and Closed Loop Control for Electric Drives"
("Steuerungen und Regelungen in der Technik elektrischer Antriebe") by O. Mohr. Papers presented at the meeting mentioned on page 16 of this Bulletin. To be published in 1959 by VDE-Verlag, Berlin.

New German Periodical: Zeitschrift für messen, steuern, regeln (Magazine for Measurement and Control) Published by Verlag Technik, East-Berlin. Three issues per year, DM 4.- each.

United Kingdom

The following books have recently been published in Great Britain:

"Feedback Theory and its Applications,
by P.H. Hammond
(The English Universities Press Ltd., London, 1958, 35s.0d.)

"Procedure for obtaining transient response from frequency response with tables and nomographs",
by V.V. Solodovnikov, Yu.I. Topchev and G.V. Krutikova. (Translated and published in Infosearch Ltd., London, 1958, 42s0d.)

"Man and automation", by L.L. Goodman (Penguin Books Ltd., London, 1957, 3s.6d.)

The following papers have appeared in the Proceedings of the I.E.E. (The Institution of Electrical Engineers):

Author(s) and Title	I.E.E. Proceedings, vol.105		
	Reprint No.	Part No.	pp.and date
J.F. Meredith, E.A. Freeman: "The simmulation of distributed-parameter systems, with particular reference to process control problems"	2376M	B 24	569-576 (Nov. 1958)
E.A. Freeman: "An approximate transient analysis of a second-order position-control system when backlash is present"	Monograph 254M	C 7	61-68 (Mar. 1958)
J.P. Ellington, H. McCallion: "The determination of control system characteristics from transient response"	Monograph 288M	C 8	370-373 (Sep. 1958)
T.M. Reenskang, J.H. Westcott: "Design of sampling servo systems in the Z - plane"	Monograph 303M	C 8	489-498 (Sep. 1958)
A. Tustin and others: "The Design of systems for automatic control of the position of massive objects"	2651M	CS 1	1-57 (Nov. 1958)
A. Tustin: "Similarity and dimensional relationships in control systems"	2562M	CS 1	58-62 (Nov. 1958)
M.V. Wilkes and others: "The design of the control Unit of an electronic digital computer"	2365M	B 20	121-128 (Mar. 1958)

Author(s) and Title	I.E.E. Reprint No.	Proceedings, vol.105 Part No.	pp.and date
M.A. McLean, D. Aspinall: "A decimal adder using a stored addition table"	2389M	B 20	129-135 (Mar. 1958)
T. Kilburn and others: "An accurate electro-luminescent graphical-'output unit for a digital computer"	2441M	B 20	136-146 (Mar. 1958)
P.L. Cloot: "A basic transistor circuit for the construction of digital-computing systems"	2585M	B 21	213-220 (May 1958)
M. Lehman: "Short-cut multiplication and division in automatic binary digital computers"	2693M	B 23	496-504 (Sep. 1958)
E. Bradshaw and others: "A train performance computer"	2425M	B 24	560-568 (Nov. 1958)
J.L. Douce and J.C. West "A magnetic-drum store for analogue computing"	2393M	B 24	577-580 (Nov. 1958)

USA

Proceedings of the American Institute of Electrical Engineers Computers in Control Systems Conference held in October 1957 are available from

The American Institute of Electrical Engineers
Feedback Control Systems Committee
33 West 39th Street, New York 18,

at a price of £ 3,50.

These Proceedings contain the following 32 papers:

- Welcoming remarks by Harold Chestnut
- Digital Computers in Automatic Control by M. Pelegrin and F.H. Raymond
- Some problems on the theory of discrete Automatic Systems by J.Z. Tsypkin
- Dynamic programming and the computational solution of feedback control problems by R. Bellman
- Characteristic and appraisal of analog-digital conversion techniques by A.K. Susskind

- A conditionally stable Control system by A.M. Letov
- A computer combining Analog and Digital principles for complex frequency network calculations by P.F. Blackman
- Computer verification of steam generator instrumentation for a nuclear power plant by D.P. Wait and E.E. Lynch
- Analog representation of heat exchange by J.M. Carteron and G. Deloux
- Evaluation of a turbojet Control on an engine simulator by C.R. Meising
- Simulation techniques in the synthesis of Automatic flight-control systems by Y. Nakada and S.R. Scroggs
- Differential analyzer aids design of electric utility control systems by Y. Nakada
- Automatic dispatching system by L.K. Kirchmayer
- The analysis of digital systems by H.A. Helm
- Analog computer study of sampled-data systems by Harold Chestnut, A. Dabul and D. Leiby
- The synthesis of computer-limited sampled-data Control systems by A.S. Robinson
- Rate limiting in incremental computers by M.H. Steward
- Real-time hybrid computers for Control systems by C.T. Leondes and M. Nethman
- Computer Control experience gained from operation of a large combined analog-digital computation system by J.P. West
- Analysis of an on-off digital computation system by J.S. Mayo
- Reduction of Control loop errors with a prediction computer by G.S. Axelby and R.H. Plath
- Computational determination of the nature of solutions of non-linear systems with stochastic inputs by R. Bellman, P. Brock and M. Misuki
- System considerations in computer Control of a semi-continuous chemical process by T.M. Stout
- Air-borne program computer by C.F. Coit and T.F. Mahoney
- General synthesis procedures for computer control by R.E. Kalman and J.E. Bertram
- An application of root-locus to a closed-loop linear Control system incorporating a human operator by J. Rodden and J.E. Mangelsdorf
- The solution of differential equations in the time domain by C.W. Steeg and R.V. Morris
- Panel discussion on fitting computers into Control systems by W.E. Sollecito
- Control system optimization using computers as Control system elements by L.F. Kazada
- A dual-mode servomechanism utilizing saturation switching by H.R. Weed and F.C. Weimer
- Optimum response of discontinuous feedback Control systems by F.W. Nesline Jr.
- Application of a self-adaptive system to the Control of air-plane normal acceleration by M.F. Marx
- Synthesis of the characteristics of a non-linear velocity feedback in positional servosystems by B.N. Naumov

Proceedings of the Institute of Radio Engineers (IRE)

The following Proceedings are - or will be - available from

The Institute of Radio Engineers
Professional Group on Automatic Control
Post Office Box 45215
Airport Station
Los Angeles 45, California

1. Published in the I.R.E. Convention Record, part 4, volume 6 "Automatic Control, Computers, Information theory"
7 papers of the three following sessions of the I.R.E. National Convention held in New-York on March 24 to 27, 1958 and sponsored by the Professional Group on Automatic Control:

a) Session 5 "Educational Needs in System Engineering"
- Panel discussion under the presidence of R.P. Johnson with Harold Chestnut, H.H. Goode, S. Herwald, R.J. Kochenburger, W.K. Linvill and J. Moore, speakers

b) Session 9 "Automatic Control - General"
- A servo-pressure Control system for the iron lung, by G.A. Biernson and J.E. Ward
- Gain-phase relations of non-linear circuits, by E. Levinson
- On the design of adaptive systems, by H.L. Groginsky
- A self-adjusting system for optimum dynamic performance, by G.W. Anderson, J.A. Aseltine, A.R. Mancini and G.W. Sarture

c) Session 27 "Statistical applications"
- Frequency-domain statistical model of linear variable networks for finite operating time, by G.W. Johnson
- The root square locus plot. A geometrical method for synthesizing optimum servo systems, by S.S.L. Chang

2. Published in the I.R.E. Transactions on Automatic Control, Professional Group on Automatic Control No. 4, March 1958:
- How the band-width of a servo affects its saturated response, by G.A. Biernson
- Analog study of dead-beat Posicast Control, by G.H. Tallman and O.J.M. Smith
- On closed-form expressions for mean squares in discrete-continuous systems, by J. Sklansky
- Bibliography of sampled-data Control systems and Z-transform applications, by H. Freeman and O. Lowenschuss.

3. Published in the I.R.E. Transactions on Automatic Control, Professional Group on Automatic Control No. 5, July 1958:

a) Proceedings of the 1957 Professional Group on Automatic Control Symposium on non-linear Control
Part 1 "Practical applications in non-linear Control"
- The design and performance of a model second-order non-linear servomechanism, by R.E. Kuba and I.F. Kazda
- The practical realization of final-value systems with limiting constraints, by R.C. Booton Jr. and A. Rosenbloom
- Combined hysteresis and non-linear gains in complex control systems, by R.V. Halstenberg

b) Proceedings of the 1957 Professional Group on Automatic Control Symposium on non-linear Control
Part 2 "Obstacles to progress in non-linear Control"
- Availability of necessary theory for the analysis and design of non-linear systems, by O.J.M. Smith
- Non-linearities in machine-tools and missiles, by J.L. Bower
- Non-linearity in process systems, by E.G. Holzmann
- The role of computers in analysis and design of Control systems, by G.P. West
- Problems of non-linearity in adaptive or self-optimizing systems, by C.E. Taylor

Handbook of Automation, Computation, and Control

Volume 1: Control Fundamentals.
Edited by E.M. Grabbe, Simon Ramo, Dean E. Wooldridge.
Published 1958 by John Wiley & Sons, Inc., New York 16.
Contents: General Mathematics - Numerical Analysis - Operations Research - Information Theory - Feedback Control.
(Volume 2: Computers and Data Processing, and volume 3: Systems and Components, will follow).

Obituary Notice

Just before passing this Bulletin for press we receive the most regretful news that

Mr. Robert van Cauwenberghe

President of the
Institut Belge de Régulation et d'Automatisme
(IBRA)

deceased in the night between December 14 and 15, 1958.

We wish to express our deep sorrow to our Belgian friends and gratefully remember the special interest which president van Cauwenberghe has shown in preparing the collaboration between IBRA and IFAC.

Professor Hoffmann, vice-president of IBRA and president of the International Society of Analog Computation, will provisionally exert the presidential functions of IBRA.