# TEMAC

# PROGRAMMED LEARNING MATERIALS FOR INDUSTRY . . .

THE MATHEMATICAL BASIS FOR MANAGEMENT DECISION MAKING, PART 1

### -MATRICES AND MATHEMATICAL PROGRAMMING

The use of computers in modern management has created a communications problem of great significance: The translation of management requirements into a computer programme is a process applying mathematical techniques largely unknown to the management ultimately responsible.

Clearly it is essential for management to understand the basis of these mathematical techniques, but it is equally essential that the method used to obtain this understanding should be rapid, effective, convenient, and above all clear to a non-mathematician.

The Mathematical Basis for Management Decision Making programme meets this specification exactly: requiring only 35 hours of self-instruction, the programme is designed specifically for the manager with little knowledge of mathematics, and even less spare time.

(Temac programmed learning materials are also available in Arithmetic, Algebra, Geometry, Trigonometry, Calculus, Modern Mathematics, Statistics, German, French Phonetics and Spanish.)

Full details from

### ENCYCLOPAEDIA BRITANNICA LTD.

Education Division Portland House Stag Place London, S.W.1

# The EUP Library of Programmed Texts

# PROGRAMMED LEARNING AND TEACHING MACHINES

A New Edition

RICHARD GOODMAN, M.A., B.Sc.

In view of the tremendous interest being shown in these new methods of teaching and realising that many would wish to know more, Mr. Richard Goodman has written a monograph which gives a brief survey of the field and its possibilities for education, industry and private tuition.

3/6 net

# ACCOUNTING STEP BY STEP

R. G. A. BOLAND

This is an experimental programme in applying new techniques to the problem of learning accounting. It is designed to teach the language and basic concepts of accounting. It is a programme of instruction which leads to an understanding of what accounting reports can and cannot tell about a business.

Publishing September at about 10/6

For further information write to:

### The English Universities Press Ltd.

Dept. E 12, 102 Newgate Street, London, E.C.1.

#### **TUTORTEXTS**

Prepared under the direction of Educational Science Division, U.S. Industries Inc. (Great Britain) Ltd. The first six books in the revolutionary new series are now ready

THE ARITHMETIC OF COMPUTERS by Norman A. Crowder at 25/- net.

ADVENTURES IN ALGEBRA by Norman A. Crowder and Grace C. Martin at 25/- net.

INTRODUCTION TO ELECTRONICS by Robert J. Hughes and Peter Pipe at 25/- net.

TRIGONOMETRY: A First Course by Norman A. Crowder and Grace C. Martin at 25/- net.

BASIC MATHEMATICS: An Introductory Course by Grace C. Martin and Anne Smalley at 35/- net.

THE ELEMENTS OF BRIDGE by Charles H. Goren at 25/- net.

#### Here are some opinions:

"TutorTexts are part of the revolution in education that is about to occur in this country. They are excellent and I strongly recommend them."

Dr. Frank George, M.A., Ph.D., University of Bristol.

"This is a breakaway. It is immediately obvious that its techniques could work."

The Times Educational Supplement.

"An entirely new approach to self-teaching. In essence they are teaching machines in book form. This method of instruction is an innovation which should prove of immense value to those who must study on their own."

Discovery.

Publishing January

### PROPER PUNCTUATION

#### KELLOG SMITH and LEIGHTON STEELE

With this TutorText as a guide the reader will learn the fundamentals of punctuation and improve the effectiveness of his writing. It includes the proper uses of the comma, full stop, question mark, exclamation mark, colon, semi-colon, and dash, how to handle quotation marks, italics, parentheses, and brackets. This book is for everyone who writes—students, secretaries, businessmen, professional writers. A complete index makes this book useful for reference and revision.

About 21/- net.

# JAMES NISBET & COMPANY LTD.

# MATHEMATICAL APPARATUS IN THE INFANT'S SCHOOL DOROTHY DAVIS

Children progress through successive stages of mathematical discovery, and the teacher must thoroughly understand these distinctive stages, and the appropriate age group for each. This book is written with this in mind. Each aspect of the child's progress is analysed, suggestions—and reasons—are given for the designing and making of mathematical apparatus. This book is copiously illustrated.

R1.15

### IT MUST BE MAGIC AND MAGIC EVERYWHERE

These extension readers follow on The Five-and-a-Half Club in the Janet and John series. They consist of well-known fairy stories by such authors as the Brothers Grimm, Hans Andersen, and others.

Limp 80 c.

Boards 90 c.

### JANET AND JOHN ACTIVITY MATERIAL

COMPREHENSION CARDS FOR THE	"MAGIC" SERIES	 	 50	c.
WORKBOOKS for:				

JANET AND JOHN-BOOK II	 				 $37\frac{1}{2}$	c.
OUT AND ABOUT	 				 29	c.
I WENT WALKING		the contract	ARRADO	Milozoi	35	C.

### THE BOBBIN DOFFERS

A delightful series for use as supplementary readers. It consists of twelve little books with a total reading content of 5,591 words and a total vocabulary of 564 words. New words added to the child's basic vocabulary are limited in number and very carefully selected. The suggested stage for the use of this series is when the basic reading vocabulary is about 500 words. That is at about the level of Janet and John Books 3 or 4, "Through The Garden Gate", or "I Know A Story".

A handbook is provided giving full details of vocabulary, suggestions for simple dramatisation, and for construction of the puppets

A Reference Chart is also provided for reference by the children or for use on the wall.

<b>Bobbin Doffer</b>	Books 1 to 12		55	 	 	each	10 c.
<b>Bobbin Doffer</b>	Handbook			 	 		50 c.
Bobbin Doffer	Reference Char	t		 	 	7	50 c.

(Major N. E. H. CHANCE, 7 Wiener's Building, 150 Long Street, Cape Town)

# Do you know ...

The O.K. Bazaars, the largest retail distributors in Southern Africa, provides employment opportunities over a wide field to school leavers and university graduates.

Appointments made include economists, lawyers, industrial and clinical psychologists, sociologists, nurses, staff trainers, accountants, architects, draughtsmen, electrical engineers, caterers, display artists, as well as matriculants and graduates who are given intensive training to prepare them for managerial appointments by merit based on performance, and restricted only by the limits of the capabilities of those seeking promotion.

In addition to work of stimulating interest and high reward, every encouragement is given to personal development; there are opportunities for continuing employment in most towns in South Africa and Rhodesia as well as in the United Kingdom where the O.K. Bazaars holds a controlling interest in a rapidly expanding chain store group.

School leavers and graduates can with confidence make personal enquiries regarding their future careers.

The

over 70 branches in South Africa



V.I.P. (JNR.) going to school.

Shell is there to help him. Today perhaps he'll be learning from maps or films or film strips or from many other teaching aids supplied by Shell to schools everywhere. At universities, too, Shell plays its part. Every year, everyone of the eight South African universities receives a financial contribution from Shell and every year Shell awards a scholarship for post-graduate studies overseas. In every way Shell helps Education to turn the V.I.P. Jnrs. into V.I.P. Snrs. Another example of Shell in the life of South Africa.





IN THE LIFE OF SOUTH AFRICA

LS.983/3



For your printing requirements consult . . .

# Durand & Bowden

Pty.) Ltd.

10 Harries Street, Johannesburg

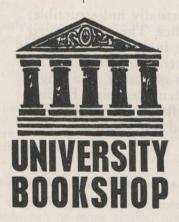
PRINTERS — STATIONERS — OFFICE EQUIPMENT SPECIALISTS

# UNIVERSITY BOOKSHOP

an invitation to visit, phone or write us ... and why

Students and the men and women who train them find exactly what they want at the University Bookshop because . . .

- \* It specialises in educational, scientific and technical books.
- \* It is staffed by specialists in this field.
- \* It has brought the Mail Order business to perfection, dealing with each request immediately.



### Central News Agency Ltd.

34 Bertha Street Braamfontein

Johannesburg

Phones: 44-7523, 44-5186 & 44-7575

# PROTEA LABORATORY SERVICES

DIVISION OF PROTEA HOLDINGS LIMITED

P.O. BOX 5598 JOHANNESBURG TRANSVAAL

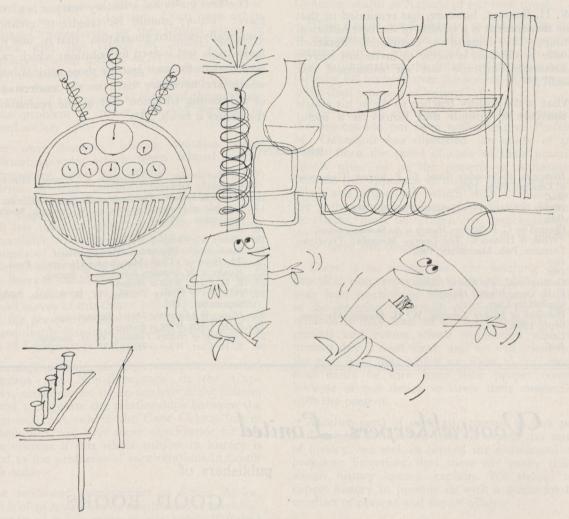
suppliers of

- ★ Laboratory Furniture and Fittings
- ★ Chemicals and Scientific Apparatus for Industry and Education

We specialise in the designing, furnishing and equipping of science laboratories for physics, biology, chemistry and geography

Branches at Cape Town Port Elizabeth East London Durban Welkom Salisbury 

# RESEARCH KEEPS BP AHEAD



# AVANT GARDE CHEMISTRY

(Chemistry with a twist to it)

What is **now** going on in AE&CI laboratories won't seem even slightly **avant garde** in the future. Like all true scientists we aim to keep ahead of the times. For example AE&CI were first to make Methanol in South Africa, which proved invaluable in the manufacture of Formalin, which in turn proved invaluable in the manufacture of formaldehyde resins, which of course are as taken-for-granted as anything can be. Chemistry-wise if there's a new angle, a new approach (or a new twist to an old idea) you can be sure AE&CI will have it first... fast!



AFRICAN EXPLOSIVES AND CHEMICAL INDUSTRIES LTD.
Cal. 6868/33/4.\*

# The teacher's best friend!

The GRUNDYTUTOR teaching machine relieves the teacher of much drudgery—in particular the deadening and so often futile labour of "marking".

The GRUNDYTUTOR (operating on the "branching principle") is an instrument for programmed learning. That means that it:

- (A) presents material to the student INDIVIDUALLY, in organised, logical sequence.
- (B) requires an *overt response*. Woolgathering (which so often occurs during the reading of a textbook) is immediately checked by means of a sharp, clear break in the learning process.
- (C) provides *feedback*, so that the student knows *immediately* whether or not his response was appropriate. The number of errors made by each student is automatically recorded.

Using the GRUNDYTUTOR means that the best students are not "throttled down" to the tempo of the poorest, nor can the slowest students fall more and more hopelessly behind the class. People unfamiliar with the modern teaching machine often tend to regard it as a sort of mechanical quiz-master and to think that its usefulness is confined to "memory work". This is far from the truth. In the words of Dr. Edward J. Green, author of *The Learning Process and Programmed Instruction:* "It represents the first practical application of laboratory techniques to education. The task of programmed instruction—as of all instruction—involves the conditioning of a behavioral repertory We do not conceive this activity to be the instilling of a body of knowledge, although what we do has the effect described by that phrase. We seek to increase the behavioral repertory of the student.

We seek to establish a complex class of behaviours and to bring that class of behaviours under the control of particular features of the environment. This is the task of teaching, whether it is directed to the pigeon, to the high-school sophomore, or to the graduate student in philosophy."

## The GRUNDYTUTOR

- -teaches individually
- -makes the best use of the student's time
- -makes the best use of the teacher's time
- -builds firm foundations of knowledge

For further information on the

ITM GRUNDYTUTOR

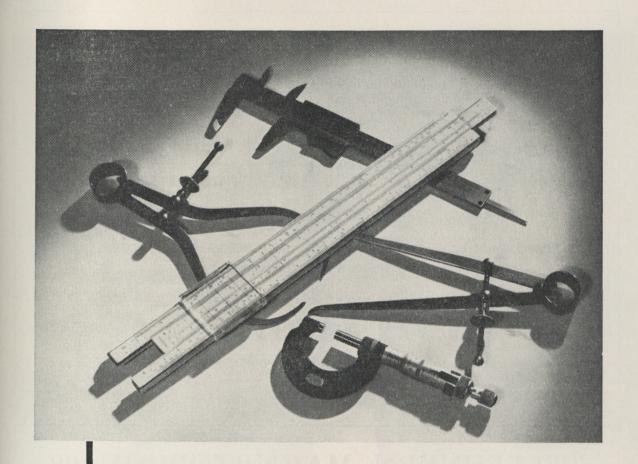
please address your enquiries to:

THE PRINCIPAL, I.C.T. TRAINING CENTRE,

"CAPE-YORK" 252 JEPPE STREET, Johannesburg. Phone 23-7359



H&a3006



# A CHALLENGE

Mining is more than a matter of extracting wealth from the earth. For the men who engage in it, it is a constant challenge to apply their skill and enterprise in solving problems—scientific, technological, financial and human. Anglo American Corporation of South Africa, Limited is one of the leaders of the mining industry in Africa and it offers attractive careers to university graduates who wish to take up this challenge.



ANGLO AMERICAN CORPORATION OF SOUTH AFRICA, LIMITED

Head Office 44 Main Street Johannesburg

SYMPOSIUM 1963/64 103



SONOR MELODIC PERCUSSION

Goldklang

RECORDERS

**ADLER Recorders DOLMETSCH** Recorders

Specialist suppliers of Educational Musical Instruments

PERCUSSION BAND INSTRUMENTS. MELODIC PERCUSSION. RECORDERS MUSICAL TEXT-BOOKS FOR TEACHER AND PUPILS

ILLUSTRATED PRICE LISTS SENT ON REQUEST

## J. VAN DE GEEST & SON

39 PLEIN STREET, JOHANNESBURG

TELEPHONE 22-1860

P.O. BOX 4046

# TELEFUNKEN MAGNETOPHON 98

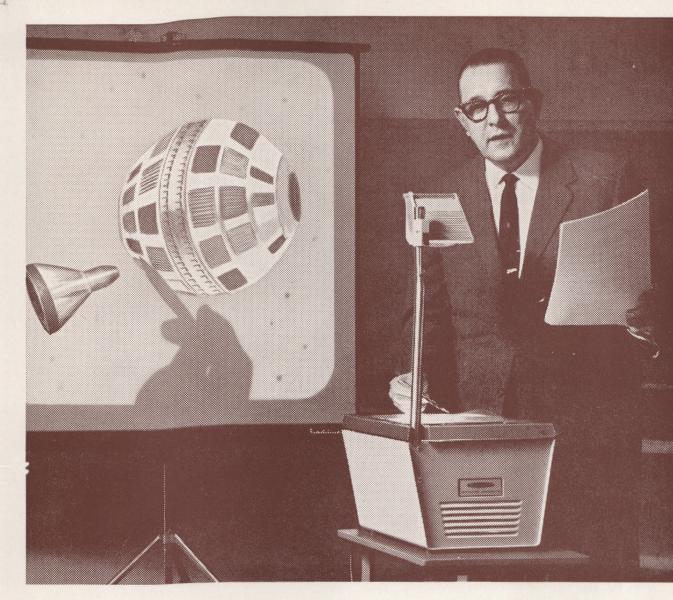


For full details contact the Sole S.A. Distributors

In 1935 the first Tape Recorder in the world carried the name "Magnetophon". Telefunken Magnetophon 98. The new half track 3-speed stereo model incorporates features usually found only in professional machines, such as separate recording/playback heads allowing "off the tape" control, transcription from track to track, echo effects and monitoring one track whilst recording on another.

IMPECTRON (PTY) LTD

P.O. BOX 10262, JOHANNESBURG - P.O. BOX 2482, CAPE TOWN - P.O. BOX 3358, DURBAN



# Now you can make transparencies and project them in 4 second

Here is a complete visual communications system that is fast, simple and so inexpensive. Now you can make a projection transparency on the spot. All you need is a "Thermo-Fax" Brand Copying Machine and a new "Thermo-Fax" Brand Overhead Projector. What is more, anybody can do it. No negatives. No chemicals. No training. No waiting.



minnesota mining e manufacturing company (South Africa) (PTY) Limited P.O. Box 10465, Johannesburg.



1."THERMO-FAX" BRAND COPYING MACHINE. Run the material you want to project (graphs, drawings, handwriting, printed material) through a "Thermo-Fax" Copying Machine with a "Thermo-Fax" Brand Projection Transparency.



2. "THERMO-FAX" BRAND OVERHEAD JECTOR. Turn on projector and place t parency on glass. You can even proje colour. Show it in a lighted room while maintain eye contact with your audit Portable Model 60 shown above.

# PHILIPS LANGUAGE LABORATORY

# TODAY'S MOST EFFICIENT MEANS OF TEACHING LANGUAGES

It is now recognised in many parts of the world that "programmed learning" is the teaching method that consistently gets EXCELLENT results. Philips Language Laboratory makes efficient use of this method. Specially adapted classrooms and the installation of technical equipment is involved, but many organisations and institutions have found that a Philips Language Laboratory pays for itself over and over again in teaching dividends.

#### HOW THE PHILIPS LANGUAGE LABORATORY OPERATES:

\* 1. All students are directed and observed from the control panel where the teacher operates a master recorder and a test recorder. \* 2. Methods can be varied, and the equipment offers facilities for dubbing, guest teachers, conversations between two or more students, and so on. For normal tuition, however, pre-recorded master tapes are used. \* 3. The master track recording, on the student's recorder, cannot be, inadvertantly erased. \* 4. Students follow the lesson and carry out instructions so that both the master tape and the students' own responses are recorded on the tapes in the individual booths. \* 5. The lessons can be played through by the students to check the exercise. The exercise, or parts of it, can be repeated as necessary until it is successfully learnt. \* 6. Individual queries can be answered by the teacher without interfering with the rest of the class. The teacher can communicate with any or all students and can listen in to what any one of them is saying.

### ADVANTAGES OF PHILIPS LANGUAGE LABORATORY EQUIPMENT:

\* Specially designed as a complete unit (for ten students), extension panels in units of ten can be added. \* Made by one of the world's largest manufacturers, with full research and development facilities. \* Simple push button operation for teacher and students—no technical distractions. \* Recorders used are adapted models of the famous Philips range. \* Unrivalled dependability: equipment stands up to continuous daily use—is backed up by prompt countrywide servicing. \* Superb sound quality. Unidirectional microphones ensure excellent sound reproduction. Headphones are of light-weight, moving-coil type, with interchangable earshells. \* Maximum tape economy. The same tapes in the students' recorders and the test recorder can be used again and again. \* All tape recorders and amplifiers are fully transistorised for maximum reliability, low power consumption and the absence of dangerous voltages in the control panels.

For further information, contact S.A. PHILIPS (PTY) LTD. Box 7703, Johannesburg. Phone 24-0531. Also at Cape Town, Durban, Port Elizabeth, Bloemfontein

