West African TECHNICAL REVIEW

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September 1978

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West African
CONSTRUCTION
Crushers
Blocks in Architecture
Blockmaking Machines
Industrial Forklifts

WEST AFRICAN TECHNICAL REVIEW

...th's cover: A variety of locally made ...s for sale in a typical Nigerian market ...Courtesy of Compix).

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Contents

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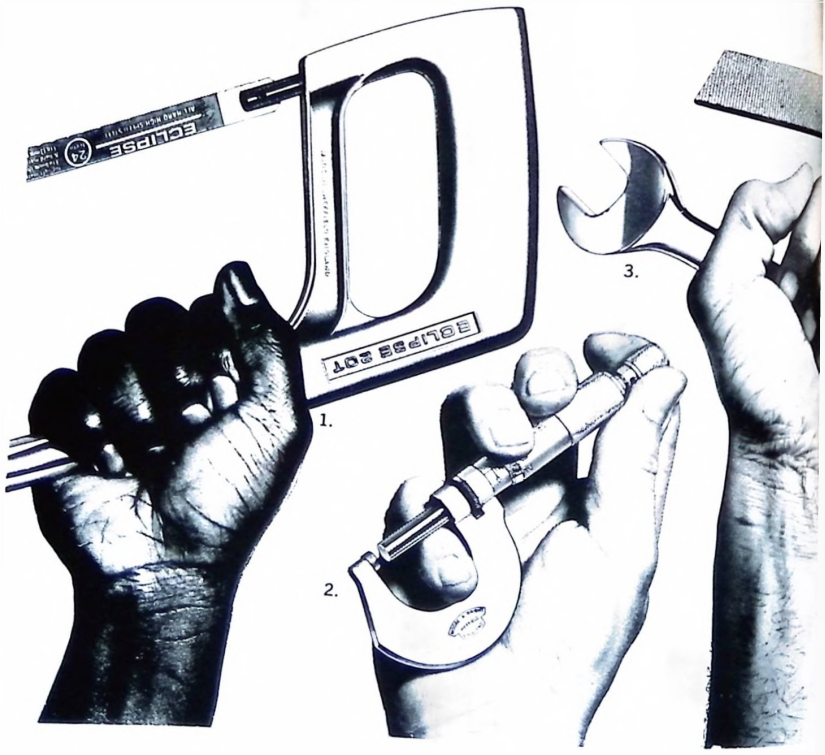

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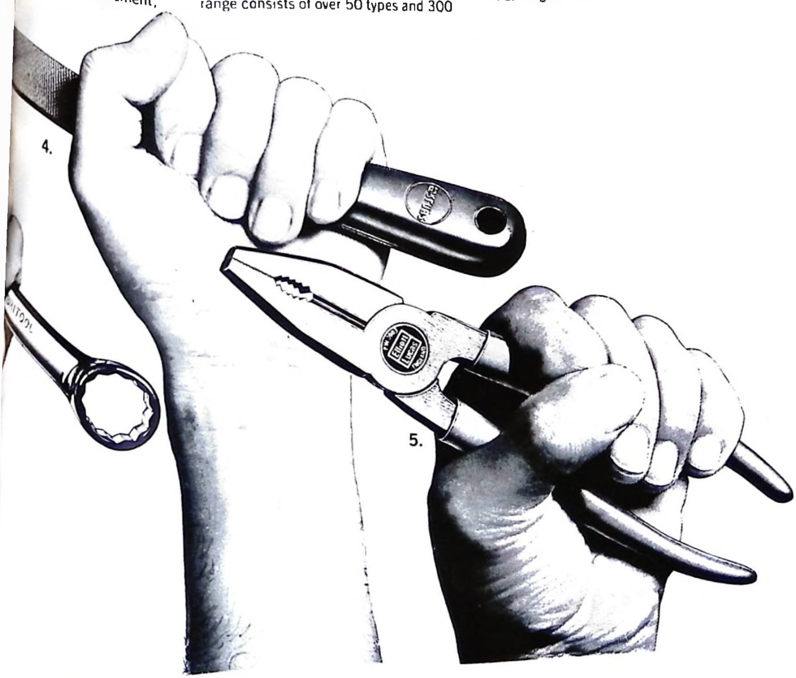


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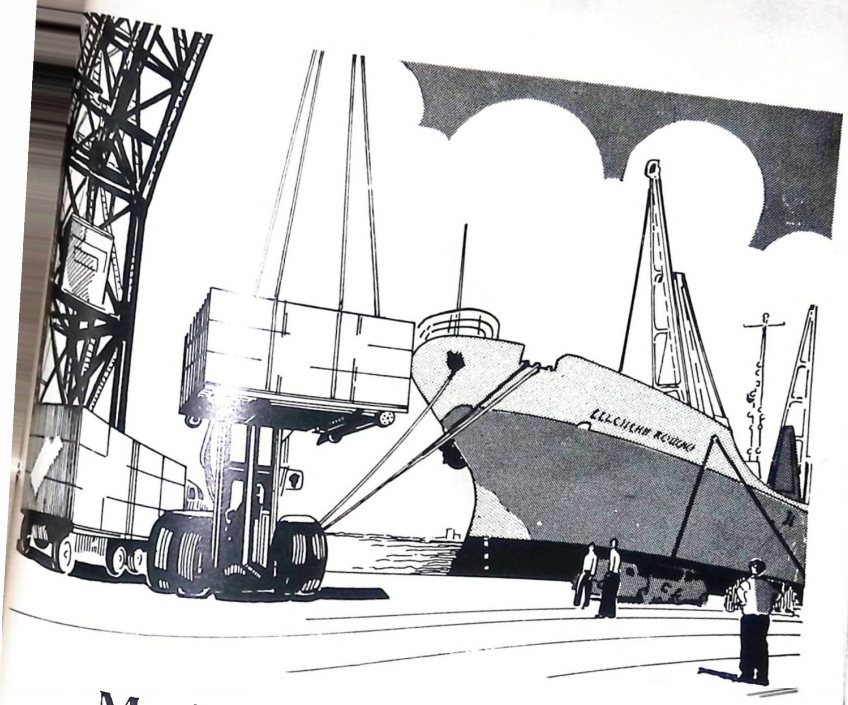

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NORTHERN EUROPE — NIGERIA

Commercial review

...ise for the future in Liberian Budget

...National Legislative of Liberia has ...ly passed a record national budget of ...million for the fixed period July 1978-...1979.

...the president's message on the bu...get ...mmented that despite the sign...nt ...eterioration of the nation's trade ba...ce ...the past year from a surplus o... $3 ...ion in 1976 to a deficit of $16 m...n, ...r economy vis-a-vis many ...er ...veloping nations withstood the se... ...ss. ...deterioration was largely due ...on ...e — Liberia's major foreign ex...nge ...rce — being adversely affe...by ...slow industrial growth in 197... ...ich ...uld not be off-set by expanded ex... ...t of ...ber products such as coffee. Unc...inty ...ut economic growth led to ...ased ...estment in new plant and equip...t in ...e world which seriously affected ...mand ...r steel.

President Tolbert proceeded to discuss ...e 1976-80 National Socio/Economic ...an which originally called for public ...ector investment at $415 million.

However, during the course of the last ...two years, it has been necessary to add a ...number of new projects, keeping in view ...both the short and long run objectives of ...planned development, and to provide for ...unavoidable escalation in the cost estimates ...of projects already in the Plan. Thus, the ...size of the four year plan has been ...increased to $585 million.

Of the $240 m. for this year's budget, $180 m. is in support of unavoidable ...recurrent expenditure needs including $42 ...m. for debt service and $10 m. for ...the OAU 1979 Summit while $160 m. is for development. In addition — for the first time in Liberian history — the budget includes external resources of $75 m. strictly in support of development. Many of these resources are in the form of foreign borrowings; however the greater part has come from bilateral and multi-lateral sources.

The proposed recurrent budget for 1978/79 is in fact $128 m., 12 per cent above the revised estimates of recurrent expenditures in the current fixed year. As far as possible, all expenditure on unproductive uses have been minimized.

The president also proposed a five per cent increase in the salaries for nurses, teachers, policemen and enlisted men in the armed forces.

Development expenditure, including external aid, is proposed at $160 m., and this is to include $26 m. for agriculture, $38 m. for road construction, $15 m. for education and training, $5 m. for health and social welfare, and $17 m. for utilities.

The president commented that they had tried to use the budget to reflect the Government's priorities and commitments, and thus the 1978/79 Plan aims at a restricting of the rural economy through the development of agriculture and agri-based industries.

In addition, some $27 m. has been provided to support activities associated with the hosting of the OAU Summit in 1979. There are plans too to utilize the OAU hotel and village as a tourist centre with the capacity to generate income and to become self-sustaining, and use the infrastructural facilities to build a satellite city.

Nigeria's future amongst oil nations

Nigeria's future among the world's great oil nations was discussed at a top level seminar recently held in Lagos, jointly sponsored by Mobil Producing Nigeria Ltd. and the Nigeria Institute of Journalism.

An important highlight was a lecture on the Nigerian Economic Outlook by the Governor of the Central Bank of Nigeria. Other key lectures included: The effects of changes in the oil price on world economy and history; the effects and purpose of control and regulation on Nigerian crude oil production; Joint ventures in Nigeria and the role of the Nigerian National Petroleum Corporation in the oil industry.

$80m for Gabon

A loan of $80m for the Republic of Gabon has been signed in Paris between representatives of the republic and nine banks, led by Citicorp International. The maturity of the loan is seven years with two years grace. Of the $80m total, $70m has been earmarked for expenditure on the trans-Gabonese railroad. The remaining part is to help finance the purchase of a Boeing 737 aircraft.

Loan for Ghana

The Export Credits Guarantee Department has agreed to guarantee a £10m line of credit which Standard Chartered Merchant Bank Limited has made available to the Bank of Ghana. The line has been agreed as part of an arrangement under which the Government of Ghana has undertaken to repay outstanding ECGD insured short-term debt of £7.6m.

The loan is to finance contracts awarded by Ghanaian buyers to UK exporters for a wide variety of goods. It has been arranged to help Ghana meet its immediate need for raw materials and other goods.

Imports to West Africa from OECD countries

(In $ million)

	NIGERIA			IVORY COAST			GHANA			LIBERIA			CAMEROON			SENEGAL		
	1975	1976	1977	1975	1976	1977	1975	1976	1977	1975	1976	1977	1975	1976	1977	1975	1976	1977
Canada	3.4	2.8	2.5		0.6	1.1		1.7	2.0		0.3	0.3		0.3	0.2		0.2	0.2
USA	44.7	64.2	80.0		5.3	7.4		11.1	12.1		7.0	7.6		3.4	4.5		3.4	3.0
Japan	48.8	47.8	84.1		5.5	8.9		3.6	4.9		234.1	207.2		2.7	3.7		0.2	0.4
Australia	0.4	0.8	0.5		0.01	0.02		0.4	0.3		0.02	0.02		—	—		—	0.02
Austria	6.7	8.5	8.3		0.2	0.5		0.3	1.2		0.1	0.1		0.1	0.4		0.3	0.3
Belgium/ Luxembourg	10.4	17.3	19.6		2.1	2.5		0.8	1.3		0.6	1.7		1.0	1.4		1.5	1.5
Denmark														0.3	0.2		0.2	0.2
Finland	4.1	3.4	6.2		0.3	0.2		0.6	0.6		2.6	2.9		0.04	0.02		0.1	0.1
France	0.5	1.3	1.5		0.1	0.1		0.1	0.2		1.0	1.4		21.9	26.8		22.0	24.9
Germany	38.6	44.4	62.4		41.1	55.3		2.4	2.4		18.9	29.4		2.8	4.3		2.7	2.9
Greece	54.4	72.3	107.8		6.1	8.2		10.1	13.9		21.4	26.8		0.1	0.02		0.01	0.01
Iceland	3.0	1.4	1.4		0.01	0.01		0.1	0.02		0.7	0.5		0.01	0.02		0.01	0.01
Ireland	0.3	0.4	1.4		0.01	0.01		0.1	0.02		0.7	0.5		0.1	0.2		0.01	0.05
Italy	2.1	2.5	4.6		0.02	0.2		0.1	0.3		0.04	0.1		2.1	3.2		2.3	3.3
Netherlands	24.9	27.3	49.4		3.6	4.7		2.5	3.2		2.2	3.8		1.3	1.4		3.1	3.6
Norway	19.0	25.5	33.5		5.1	6.3		2.3	3.0		12.5	7.4		0.3	0.1		0.1	0.1
Portugal	3.7	5.4	4.0		0.4	0.5		1.6	1.6		27.8	24.8		0.01	0.08		0.01	0.05
Spain	0.5	0.3	0.3		0.2	0.3		—	0.001		0.004	0.02		0.6	1.2		0.6	0.8
Sweden	7.7	6.1	10.8		1.4	2.2		0.6	0.4		4.5	2.0		0.1	0.2		0.2	0.5
Switzerland	4.7	5.9	9.01		0.4	0.5		0.7	0.9		11.6	18.9		0.4	0.3		0.3	0.3
Turkey	9.8	9.2	13.6		1.0	2.4		1.5	4.2		1.2	0.9		—	—		—	—
UK	0.3	0.1	0.1		—	—		—	—		—	—		1.2	3.0		1.4	1.4
Yugoslavia	93.84	115.7	115.5		2.7	3.7		11.9	14.6	7.7	3.6	3.1		—	—		0.01	—
	1.5	5.5		0.01	0.01		0.7	1.2			1.2	—						

Source: OECD

w company
communications

n new company called C.C.L. has recently been formed which ecializes in the supply of a wide range of communications, audio visual and broadcasting equipment and spares for the English African market. They have associate companies in West Africa (International Communications Consultants, Sierra Leone and International Communications Services, Liberia) and this together with their intimate knowledge of the English market enables them to provide a speedy comprehensive service for their customers. Being a smaller company with a 24-hour telex service they are able to supply a fast, personal service for urgent spares.

Large loan for I.Coast

The World Bank has approved a loan of $29 m. to the Ivory Coast Government in support of road development projects. It will cover feeder roads and highway maintenance. The total cost of the project is $63.2 m., of which the Ivorian Government is providing $34.2m.

Agricultural products and timber from the different regions of the country reach their markets or ports primarily via road transport. The project is designed to provide improved transport services for small farmers and the rest of the rural population of these regions. It consists of a 3½-year programme for the improvement and maintenance of feeder, primary and secondary roads, construction of regional workshops and purchase of equipment.

Technical assistance for staff training, planning, implementing and monitoring the feeder roads, and a study to analyse the subsidy and taxation system for freight transport is also included in the scheme.

EXECUTIVE'S' CALENDAR

A month's service listing some of the major events in West Africa and around the world that may be of interest to our readers. Further information on most events can usually be obtained from the commercial office of the embassy of the country concerned.

OCTOBER		
1-29	INTERIEUR '78 International Interior Decoration Show	KORTRIJK BELGIUM
7-11	International Exhibition of Public Works Equipment & Technology	SINGAPORE
10-14	Exhibition of Business Machines and Equipment Kt '78	HELSINKI
11-14	IGB '78 International Trade Fair for Industrial Cleaning and Factory Hygiene	DUSSELDORF
12-17	FAMETA Trade Fair of Metalworking Equipment	STUTTGART
12-18	International Technical Fair	STOCKHOLM
12-23	International Exhibition of Instruments & Apparatus for Scientific Research	MOSCOW
13-17	INTERBIRO — International Exhibition of Data Systems Processing	ZAGREB YUGOSLAVIA
15-20	INTERNASZ — International Trade Exhibition for Textile, Clothing & Shoes Machinery	POZNAN POLAND
15-23	EQUIPHOTEL INTERNATIONAL — International Hotel & Catering Industries Equipment Exhibition	PARIS
5-15 Nov.	CANTON FAIR — Chinese Export Commodities Fair	CANTON CHINA P.R.
7-21	TRANSPORT '78 — International Trade Fair for Transport Systems for Goods & Passengers	MUNICH
7-21	HOUT International Wood & Allied Products Exhibition	ROTTERDAM
8-21	ELECTROTECHNIK '78 Electrotechnical Trade Exhibition	DORTMUND
8-27	International Office Equipment and Data Processing Exhibition	CAIRO
9-22	INTECSOL International Exhibition of Solar Technology & Equipment	VERONA ITALY
1-25	EUROCARNE — International Exhibition for Meat & Meat Industries	VERONA ITALY
1-26	INTERHOGA AUSTRIA — International Fair for Hotel & Catering & Great Kitchens	VIENNA
4-29	ORGATECHNIK — Incorporating the International Office Trade Fair for Fittings & Equipment	COLOGNE
5-29	BUDATRANSPACK International Packaging & Material Handling Exhibition	BUDAPEST

Nigeria's loan...

Details of Nigeria's plans to borrow a further ₦1.5 billion to finance development in the current financial year were given by the Governor of the Central Bank, Mr. O. O. Vincent.

The money to be borrowed is part of the ₦2.8 billion FMG has authorised the Central Bank to obtain from overseas. The remaining ₦1.3bn will be raised through internal compulsory savings.

The FMG has taken measures for this financial year to check unnecessary public expenditure by cutting down on imports and giving greater encouragement to local producers. According to Mr. Vincent, Nigeria's financial problems would be solved if agriculture was given its proper place.

Club de Dakar promotes industrial co-operation

One of the objectives that was revealed in the recent Club de Dakar meeting in Birmingham, UK, was to promote ten activities in the developing countries, because they correspond with certain economic criteria. These are: the shoe industry; the manufacture of cycles and motorcycles; the manufacture of components, of small electrical appliances, of telephone equipment and the assembly of radio and TV sets; hosiery; ready-made clothing industry (underwear, shirtmaking); the wood and furniture industries; the manufacture of games and toys; the manufacture of pulp, paper and cardboard; the steel industry and the nonferrous metal industry, and the production of fertilizers.

This list, although not exclusive, is the outcome of a radically new conception of industrial co-operation, since it requires agreement on the redeployment of certain activities and agreement on a method of work providing for minimum cost and maximum advantage.

Geographers meet

An international symposium on population geography and an international working group on market place exchange system has recently been held at the Department of Geography, Ahmadu Bello University, Zaria. Similar symposia on different aspects of geography were held in other Nigerian universities. The symposium preceded the 1978 regional conference being organised by the International Geographical Union held in Lagos in August.

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de mission
t. Coast and Liberia

London Chamber of Commerce is g a British Overseas Trade Board-ted trade mission to the Ivory Coast Liberia 15-17 October. The mission sists of 20 representatives of firms g goods and services to various s including agro-industry, chemical nical and electrical industries, civil structural engineering, educational ng, furnishings and design, printing and ing industries.

ggins Teape Overseas Sales Ltd., a national paper manufacturer and con-er company, is a good example of firm included in this mission. ording to the parent firm, the ue of annual exports to the Ivory Coast and Liberia are quite considerable because ggins Teape already realise the market ential they shall be looking to expand r present share of the market through tacts made on this mission.

Mr. Howard Wolf, Senior Partner of the Howard Wolf Consultancy, will also be participating in the mission. His firm, a consultancy in the construction and engineering services field, has previously been involved in various West African countries, notably Nigeria and Ghana. He is very interested in exploring opportunities in both the Ivory Coast and Liberia and hopes the mission will lead to the establishment of a joint venture with local firms.

Mr. Geoffrey Wood, consultant to the Ove Arup Partnership, will be the mission leader. Ove Arup is an engineering consultancy already very active in both the countries and they are the consultants for the new hospital in Man, Ivory Coast, and also the Totota/Ganta Road in Liberia and a new conference centre and another hospital in Liberia.

Oil palm estate for Ghana

The Commonwealth Development Corporation (CDC) is to provide financial, technical and management assistance to Twifo Oil Palm Plantations Ltd. which is to establish an oil palm estate with adjacent smallholdings covering some 6,000 hectares and an associated processing mill in the Central Region of Ghana.

CDC will lend £3 million to the Government of Ghana for offshore procurements in connection with the processing mill and CDC will itself provide corporate management and technical assistance to the company.

Tractor for small scale farmer

The Branch Manager of G. B. Ollivant, a division of UAC of Nigeria Ltd. in Enugu has called for the introduction of new agricultural techniques to boost food production. He was speaking at the demonstration of a new "Progress Walking Tractor" specially designed for small scale farmers for soil tilling and ridge-making. The company claims this tractor is a major answer to some of Nigeria's agricultural problems, and has been made especially for African soil.

New agents appointed in Nigeria

Wolf Electric Tools Ltd., leading British manufacturers of industrial duty portable electric tools have recently appointed E. Osborne (Nigeria) Ltd. in Lagos and Enugu as their factory representatives in Nigeria.

The appointment of E. Osborne is the first step towards revised distribution arrangements, designed to give maximum availability of Wolf products throughout Nigeria. By the end of this year, Wolf plan to have established a network of direct importers in all major towns and cities, selling their complete range of power tools and providing effective after sales service.

Komatsu Ltd. have appointed Holt Engineering in Ikeja as the main distributors for Nigeria in all states except Ogun, Ondo, Oyo, Bendel and Kwara. Mr. A. G. Purvis has been appointed Divisional General Manager and will be based at the company's headquarters.

₦10m hotel to open shortly

The Port Harcourt Hotel Presidential extension built at a cost of over ₦10m is to be ready for use in March 1979. The five storey hotel comprises of 236 bedrooms and additional facilities such as a Casino, night club, restaurant, banqueting room and three conference rooms. Proposals are also underway to install an electric plant to ensure continual power supply. The hotel will employ 300 people.

Commercial review

BEER:
Nigeria's biggest growth industry

Nigeria has an extremely large beer-drinking potential and at present the demand cannot be met. It is claimed that breweries operating within Nigeria produce around 4.5 m. hl/year and the current demand is estimated at 20-50% higher than this figure. With a number of brewery projects coming on stream, this could almost be met from home production by the end of the year.

According to a recent survey carried out by J. O. Ogundiwin of the Department of Food Science and Technology at Ife University on the beverage production and consumption scene in Nigeria, beer is becoming increasingly popular and has displaced locally produced drinks like palm wine as the most popular alcoholic beverage. A survey was conducted amongst 200 male staff at Ife University to ascertain trends in the drinking habits of Nigerians. The results are shown below:—

Table 1. Breweries at present operating in Nigeria

Company	Site of brewery(s)	Remarks
Nigerian Breweries Ltd	Lagos, Aba and Kaduna	Biggest brewery company. Heineken/UAC involvement. Brands: Star and Gulder lagers.
Guinness (Nigeria) Ltd	Ikeja (stout). Benin (stout and lager breweries)	Second largest brewery concern. Guinness now has minority shareholding. Brands: Guinness Foreign Extra Stout, Harp Lager.
Northern Brewery	Kano	Owned equally by Kano State Govt. and West African Breweries. Brands: Double Crown lager, Power stout, Affiliation with Emborg/Cerekem.
Golden Guinea Breweries	Umuahia	Owned by Imo State Govt. Expanded recently by Kosmos to 150,000 hl/a. Brands: Golden Guinea lager, Eagle stout.
Bendel Brewery	Benin City	Owned by Bendel State Govt. 1976 expansion by Kosmos to 300,000 hl/a. Further plans for 600,000 hl/a. Brand: Crystal lager.
Cross River Breweries	Uyo	Owned by Cross River State Govt. Built by Brauhaase, 1976. Capacity 150,000 hl to be doubled in expansion plan. Brand: Champion lager.
West African Breweries	Abeokuta, Lagos	Brand: Top lager. Affiliation with Emborg/Cerekem.
Premier Breweries	Onitsha	Built by Brauhaase 1977. Capacity 350,000 hl/a.
Oyun Breweries	Offa	Built by Brauhaase, 1977. Capacity 150,000 hl/a.
International Breweries	Ilesha	Built by Brauhaase 1978. Capacity 200,000 hl/a.

Table 2. Some of the Nigerian brewery projects at present underway

Site of brewery	Remarks
Ibadan (Oyo State)	Planned as Nigerian Breweries' fourth brewery
Agbarha (Bendel State)	Brewery owned by Superbru (new company formed by Ibru, Skol and Unibra). To brew Skol lager. On stream late 1978. Ultimate capacity 500,000 hl/a.
Makurdi (Benue State)	Development by Kosmos to 300,000 hl/a. State Government participation.
Lagos	Development by Kosmos to 400,000 hl/a. Lagos State Government participation.
Jos (Plateau State)	Development by Cerekem. Brewery will be State owned
Illorin (Kwara State)	State Govt. participation to produce beer and soft drinks.
Akewe (Ondo State)	State Govt. participation to produce beer and soft drinks.
Sokoto (Sokoto State)	Brauhaase development with State Govt. participation.
Owerri (Imo State)	Financial involvement by a Nigerian Bank.
Enugu (Anambra State)	Company called Diamond Breweries.
Ijebu-Ode	On stream 1979. To be run by the Continental Brewery Co. with help of BGI of France.

Table 1. Analysis of respondent's first and second choice of beverage.

Beverage	% of all respondents	
	1st choice	2nd choice
Lager Beer	22	19
Stout Beer	9	16
Wine	2	10
Spirits	3	4
Soft drinks	45	7
Ogogoro	1	1
Otika	1	4
Burukutu	—	2
Palm wine	16	17
Sekete	1	—
Raffia wine	—	1
Total	100	81*

*19% of all respondents had no second choice.

Table 2: Analysis of respondent's first and second choice of alcoholic beverage

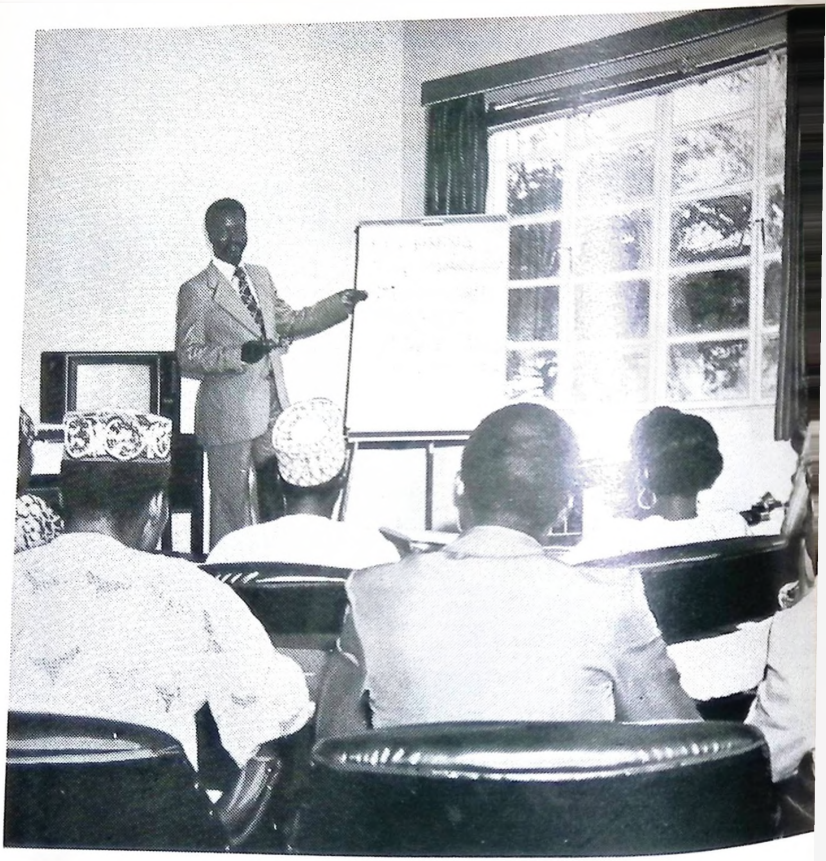
Alcoholic beverage	% of all respondents	
	1st choice	2nd choice
Lager Beer	40	25.7
Stout Beer	16.4	21.6
Wines	3.6	13.5
Spirits	5.5	5.4
Ogogoro	1.8	1.4
Otika	3.7	5.4
Burukutu	0	2.7
Palm Wine	29.0	23.0
Raffia Wine	0	1.4
Total	100	100

However, judging from the survey, soft drinks are still a much more popular beverage than beer, but this may well be due to the fact that about 40% of the people questioned were Moslem.

Appropriate technology works

Following an exhibition arranged at the Fourah Bay College, Freetown, to coincide with a conference on "Appropriate Technology for Rural Societies" a trailer dustbin on show, was considered one of the finest examples of appropriate technology. Manufactured locally, and made of heavy duty metal, the trailer dustbin is cheap and suits the environmental conditions. Further more it is not a labour saving device, important in areas of high unemployment.

The trailer dustbin was developed by the Kupelian Brothers, and as part of a pilot project, seven can now be seen in prominent places in Freetown, as a response to the "Build a Healthier Nation campaign". The trailer is eight cubic metres in capacity, three metres long with two wheels fitted in the centre and four sliding doors. It has been designed to be towed behind a Landrover and can be tipped manually and is suitable for narrow roads and traffic congestion.



Barclays training is so famous that they teach the staff of other banks too

Staff training is important at Barclays. Important for efficient banking, for good customer relations. That's why the Barclays Staff Training Centre has got such a good reputation, so good that other banks allow Barclays to train their staff.
This just shows you the confidence that other banks have in Barclays.

And that's another reason why Barclays are known as the banking experts.

BARCLAYS
Barclays Bank of Nigeria Limited

The banking experts

mmercial review

nders wanted to xploit iron ore

ritania's Société Nationale Industrielle Minière (SNIM) has invited firms wich may be interested in tendering for some part of the supply and works contracts involved in exploiting new iron ore deposits. The project is expected to cost some $600m — to submit prequalification applications.

The invitations are in respect of mining equipment. (open-cast mining) material handling. civil engineering works and fuel storage installation.

A large part of the investment needed is to come from Arab development funds.

Warri refinery starts production

Nigeria's second oil refinery being built about seven kms. away from Warri, is to be commissioned this month. The contract was awarded in 1976 to Saipem Progetti. Testing for the refinery has already commenced, producing 60,000 barrels a day of refined petroleum. When fully operational, it will produce 100,000 barrels a day.

The Warri refinery is programmed to produce refined petroleum of better quality than that sold in Nigeria at the moment. The refinery has 59 storage tanks, six of which will be used to store crude to be pumped directly from the exploration wells in the Warri creek.

The FMG has allocated N1m. for the expansion of the Ikogosi Warm Spring Tourist Centre in Ondo state. The state commissioner for Trade, Industries and Co operatives announced that the spring has two modern chalets, two swimming pools and one dining hall.

A terrazo tiles factory is to be built at Minna, Niger State, by Ayss and Co. Ltd. The project is estimated to cost half a million naira.

Agri-Petco, which is developing an oil find off Saltpond in Ghana, has said that proposed drilling work is scheduled for October. Production could rise fairly soon to 10,000 barrels a day, the company said.

A Lagos-Jeddah-Kachi air service has been launched by Nigerian Airways. The service is the second new international route launched by Nigerian Airways this year; the first was the Lagos-Accra-Robertsville-New York service which was launched in May.

The **Engineering Industries Association** from the UK are making a trade mission to Nigeria and Ghana this month.

The ninth part of a series by the author of "The A-Z of Industrial Salesmanship", and founder of the Institute of Sales Engineers, dedicated to all sales operations striving to achieve maximum results from their existing resources.

CUSTOMER RECORDS THAT WORK

THE INFERENCE from our title this month is that the customer records kept by most salesmen *DON'T* work. And that's a fact.

They may be too small, badly designed, stored in a way which makes reference difficult, not kept up to date by the salesmen, in fact, many companies don't even provide their salesmen with any standard format for customer records, they expect their salesmen to devise their own system.

Which is why there are so many little black books around the selling scene, and why, when salesmen leave a company, they take all their records with them — their employer's life blood — and nobody lifts a finger to stay them.

Precious little attention is given to customer records in the average company and, as a result, an awful lot of valuable selling time is totally wasted, and the status and reputation of the company is often damaged, by an inept salesman calling on a customer and forgetting what happened on the previous call, or forgetting to do, or to take with him, something that had been agreed on the previous call.

This forgetfulness is inexcusable, because the salesman's own record on any particular customer should tell him when next to call, why he must make the next call, who he should see and what he should take with him. If the record doesn't do this, the salesman and his company will lose business, short term and long.

A company should *always* provide its salesmen with a standard type of customer record system. Then there can be no argument when the salesman leaves that the records are the property of the company.

More important even than this, when the company has appointed a new salesman to the vacant territory, it can provide the new man with a full set of records for the customers in that territory, and so drastically cut the time it usually takes to make the new man effective.

For the same reason, the sales manager should make sure each of his salesmen keep their customer records really up to date and make them work for them. It is one of the key things the sales manager should check on when he spends time with his salesmen in the field — like the "Outstanding Proposals" sheet.

Many companies, because the customer records kept by their salesmen leave a lot to be desired, and often vanish when a salesman moves on, tend to try to duplicate the records at headquarters. This never really works, because headquarters never has all the information that the salesmen have on the customer. So the result is an awful lot of extra time and effort spent futilely, simply because of a lack of basic discipline.

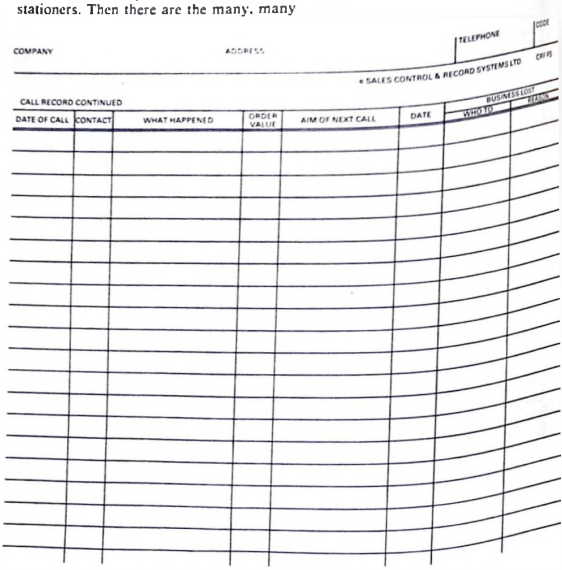
The best record

There are many proprietary customer record cards and systems available through stationers. Then there are the many, many different cards and books designed by companies themselves for their own use. Rarely do we come across one that fulfils all the requirements of a really good customer record.

The best customer record is in the form of a manilla foolscap size file, because only a file can keep all the salesman's information on a customer IN ONE PLACE: Copy quotations, action requested, correspondence, drawings, etc., are all stored in the file, and the sides of the FILE ITSELF form the customer record card.

A standard foolscap size file has 17 times as much writing area as a 5" x 3" record card, so much more can be done in designing a format of record card which is really effective.

Continued


COMPANY ADDRESS TELEPHONE CODE

© SALES CONTROL & RECORD SYSTEMS LTD

CALL RECORD CONTINUED

DATE OF CALL	CONTACT	WHAT HAPPENED	ORDER VALUE	AIM OF NEXT CALL	DATE	BUSINESS LOST WHO TO	REASON

mmercial review

ake off" for mes Charter flights

s Leisure Services programme for rter flights has commenced operations. e flights will take members to overseas nations starting with a Lagos London t. In addition to operating tourist grammes The Times Leisure Services is engaged in Travel Agency, Car Hiring ice, Trade Exhibitions, Hotel and ering and Selling Home Appli ces.

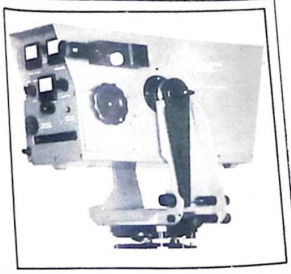
ore airline news...

A five day meeting of officials from 22 rican countries has taken place in Accra discuss shipping freight rates on cocoa and other products from West and Central Africa. Representatives from several lines attended, including UKWAL and the American West Africa Freight Conference.

A bilateral air service agreement has been set up between Nigeria and Morocco and provides a weekly service between the two countries.

Ilorin international airport has been officially opened by the Managing Director of Nigeria Airways. At present an F28 aircraft carrying 70 passengers flys between Lagos, Ilorin and Kano three times a week. A Boeing 747 which will carry 100 passengers is shortly to be introduced and there will be direct flight from Ilorin and Kaduna.

The Nigerian National Supply Company (NNSC) has stopped issuing its authority to load documents to cement dealers in an attempt to put an end to the practice of faking these documents. A circular sent out by the Aeromaritime Services has requested all cement dealers to produce their original allocation documents for inspection. The cement dealers have also advised against offering tips to loaders at jetties to secure preferential service.



We wish to point out that the above photograph of an ME 3000 Mekometer on page 87 of the June 1978 issue appeared upside down.

TCL believes that all-round telecommunications experienc

starts with local back-up

In Africa, TCL offers the one important factor that secures – and fulfills – contracts the world over. Experience. All-round, in-depth, *local* experience – fifty years spent mastering every facet of telecommunications cable and installation. In North and South Africa, East and West.

Today, you can call upon that expertise to design and plan complete cable networks, or to advise on such projects.

Our extensive manufacturing capacity covers long-distance and junction cables for interconnection between telephone exchanges, together with local network cables for connection between exchange and subscriber.

You can order all types of cable ranging from a single pair, up to 4,800 pairs of conductors – any produced to meet a variety of specifications in conductor size, insulation and sheathing.

So, whatever your requirements, contact our Export Sales Department for advice – facts and figures. It's what we're experienced for.

TCL

the sure way of saying telephone cables

Telephone Cables Ltd., Dagenham, England. Tel: 01-592 6611. Cables: Drycore, Dagenham. Telex: 896216.

Brief...

Special Marketing Unit of Ghana is to [illegible] a ₵100,000 site for foodstuffs [illegible] in the Awutu district. A plant [illegible] is also to be set up in the area to help [illegible] farm implements.

The Ghanaian Commissioner for Economic [illegible] has asked the Council for Scientific and Industrial Research to [illegible] all its resources to set up a centre for [illegible] the suitability and adaptability [illegible] tools and equipment imported into the country.

Ilorin town International Airport [illegible]gi, is to be upgraded to accommodate [illegible]7 jets and to meet the landing demands of the 1980 OAU Summit Conference, according to the Minister of Transport and Communications, who is also keen on obtaining an Instrument Landing System.

Aer Lingus has been engaged to streamline and improve the operations of Ghana Airways Corporation.

The Ghana Highway Authority has begun an "Origin-Destination Census" on motorists to help it draw a comprehensive plan for road maintenance, improvement and the construction of new routes and bypasses throughout Ghana.

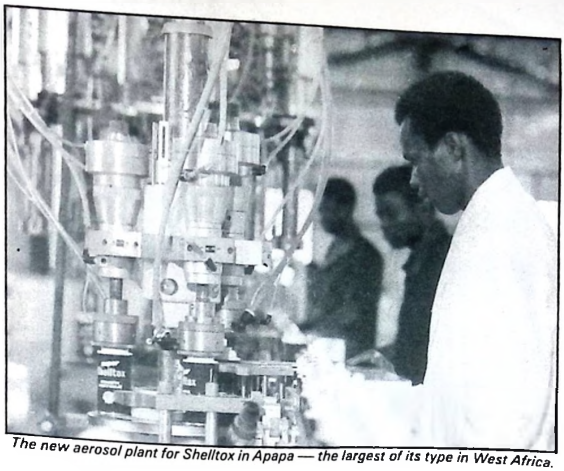
The Nigerian National Shipping Line is to expand its agency services — this will serve as a prelude to the establishment of a subsidiary agency to supervise the company's agency operations. At the moment the company is operating services at Apapa and Tin Can Island in Lagos, Port Harcourt, Calabar, Warri, Burutu and Koko.

The Benue State Government is to build a **new General Hospital** in Makurdi at a cost of ₦8 million. When completed, the hospital will serve as a teaching centre for the training of medical personnel in the state, according to the state's Commissioner for Health.

A ₦23 million ultra modern hotel has recently been opened in Zaria.

Nigerian Airways has been given permission by the FMG to revise its domestic fares and rates upwards by 25% with effect from 1st September. The airline will also make a 10% harmonization of fares on certain routes which have enjoyed concessionary low fares.

The Mandilas Group of Companies is updating its service operation by commissioning the group's ICL 2903 computer at its main office in Lagos. The computer will be used mainly in the Accounts Division.



The new aerosol plant for Shelltox in Apapa — the largest of its type in West Africa.

Importation of newsprint in Nigeria will end in 1980 when the Nigerian Newsprint Manufacturing Company at Itu, Cross River State, goes into production, according to one of the company's engineers. The mill will produce at the rate of 100,000 tonnes of newsprint a year.

The Nigerian National Petroleum Corporation (NNPC) is to resume off-shore drilling having acquired SEDNETH 1, and off-shore rig hired from, and to be operated by the **South Eastern Drilling Company** (SEDCO). The equipment has been hired at an estimated cost of ₦2m for a year.

Conmen Nigeria Ltd. is to build a ₦500,000 pharmaceutical factory in Lagos. The factory is being built in partnership with Irish and American businessmen at the Isolo Industrial layout and will employ 500 people.

The Association of African Industrial Technology Organisations (AAITO) has recently been formed in Lagos following a meeting with Government, Industrial Research Institute and university officials. Its specific purpose will be to promote co-operation among African countries with international funding, to initiate programmes for improving technological institutions, training technological staff and the commercialization of research results.

The Upper Volta Integrated Rural Development Project will allow 46,500 small holders to increase their production of cotton and cereal thanks to the construction of a corn shelling mill, the installation of storage means and an irrigation system.

An agricultural project costing ₦48m has been established in Gboko Local Government area of Niger State, and is jointly owned by the World Bank and the Niger State Government. The project is intended to produce more tractors for use on farms in the state.

A new association for Ghanaians in the UK is to be launched before the end of the year.

Called the Ghana Union, its aims include the care of Ghanaian's, promotion of unity among Ghanaian's in the UK and creation of opportunities for cultural expression.

The latest forecast of the 1978 **world cocoa production** is 1,465,000 tons, of which

Ivory Coast	290,000 tons
Ghana	278,000 tons
Brazil	249,000 tons
Nigeria	210,000 tons
Cameroon	105,000 tons
Others	333,000 tons

Ivory Coast Coffee trade is expected to total 195,000 tonnes this season, a drop of about one-third over the previous season's crop.

New appointments

● **Mr A. B. Ajayi-Majebi** has been appointed the General Manager of Gottschalk Building Material Division of the UAC Nigeria Ltd.

● **BP Nigeria Ltd.** has announced the promotion of three managers to Departmental Management positions.

These are Mr. S. O. Odunaike who becomes Manager, Staff Administration, Mr. E. O. Olaleye now Finance and Accounts Manager, Mr. N. O. Ugochuku, who becomes the Planning Manager.

● **Mr. Ayo Afolabi,** the area manager of Palm Line Agencies (Nigeria), a division of UAC of Nigeria Ltd, is to become the next general manager of the company.

● **Mr. A. A. Faal** has been appointed general manager of the Central Bank of the Gambia.

ompanies & contracts

(Nigeria) Ltd. is to award a large parts airfreight contract shortly. The contract is for the airlift of automobile components from Austrian factories to the Commercial Vehicles Assembly Plant at ...—Nigeria. This project will involve ...tkm and will span at least 15 years. According to the *Business Times* a company official of **Steyr-Daimler Puch AG** said that the company plans to produce 3,000 lorries of 20 tons a year, increasing to 8,000 vehicles per year with the introduction of two additional models of heavier tonnage.

The bid to win this contract is being keenly contested by leading European carriers. **Austrian Airtransport (ATT)** Company is most likely to win the contract but other airlines will benefit as neither the Austrian Airtransport nor Austrian Airlines have enough carrier-aircraft to handle the contract single handed.

... Power Plant, UK has received an order worth £320,000 (₦403,300) from a Lagos haulage and trading company for generating sets. The sets equipped with Perkins four cylinder diesel engines are to be used for providing electric power in rural areas.

Whessoe Systems and Controls Ltd., have negotiated a contract valued in the region of ₦240,000 to supply their Whessmatic 500 telemetering system and tank level gauging on a number of oil storage tanks at the Kaduna Refinery of the **Nigerian National Petroleum Corporation.** The order was awarded to Whessoe by **Chiyoda Chemical Engineering & Construction Co. Ltd.,** Japan, the main contractors for the refinery construction.

The first consignment of **Petbow** generating sets, forming part of an order to supply generators to teacher training colleges throughout Nigeria's Northern States, were recently flown from Stanstead Airport to Kano.

Twelve Petbow generating sets rated at 200kW and spares weighing more than 50 tons were flown by DC10. A total of more than 30 Petbow generating sets are to provide total base load power for the college dormitories and classrooms. Each installation will comprise three sets in a combination of Petbow model 100R2 and 200R63 generators rated at 100kW, 125kVA and 200kW, 250kVA respectively. All the sets, powered by Rolls Royce diesel engines, incorporate automatic synchronising and auto load sharing facilities.

The order has been placed with Petbow distributors, **Holt Engineering** as part of a turnkey project which includes the building and installation of the power houses and auxilliary equipment.

According to *European Chemical News* the Spanish contractor **Tecnicas Reunidas** is to be awarded a turnkey contract for a phosphate plant in Togo, forming part of a $300m fertiliser complex at Lome.

ECHO a UK charitable organisation is to supply Le 300,000 worth of drugs to Sierra Leone. The drugs will cost half to one-third of the usual market price.

Oilseeds Development, a specialist division of the international agricultural consultants **Minster Agriculture,** has recently won a major contract for the production of groundnuts and related crops in Sierra Leone.

This project will involve multi-disciplinary teams of specialists working in the country and preparing practical technical programmes as a basis for investment.

The Oilseed Development Unit provides a complete service to the growers and processors of oilseeds. Minster Agriculture has gained considerable experience in the cultivation of oil bearing crops, particularly annual crops. which can be grown as a cash crop by the small farmer. Expertise in the extraction. processing and refining of vegetable oils is provided by an experienced team of project engineers, **White Young Project Engineering Ltd.,** who specialise in the design and implementation of oilseed processing facilities, and who are joint venture partners in Oilseeds Development.

An Australian company has won orders worth nearly $2 million to supply cane harvesters to the West Coast of Africa.

The company, **Massey Ferguson (Australia) Limited,** will supply 15 of their model MF 205 cane harvester to the Ivory Coast and six to Nigeria. The machines feature special capabilities needed in the areas where they were sold.

The contracts also entail training and the running of special schools for mechanics and others with emphasis on the practical side of maintenance and operation, to get the best results from the harvesters.

Bauchi State Ministry of Agriculture has awarded a contract for the supply of 50 Steyr tractors model 768 with 70 HP and 50 Steyr tractors model 1108 with 115 HP to **Messrs Nigerian Technical Company,** Bauchi Branch. Together with the tractors are 420 implements like ploughs, ridgers, trailers, maize and rice planters.

180 tractor drivers of the Ministry of Agriculture, Bauchi State, have undergone an intensive training scheme which was led by an instructor of Steyr-Daimler-Puch AG, training them not only how to drive and use tractors and implements, but also how to maintain them.

The contract mentioned above amounts to ₦2.4 million. Supplier of these tractors and implements is **Steyr-Daimler-Puch AG** of Austria. Steyr's subsidiary, **Steyr Nigeria Limited,** a joint venture company with the Federal Republic of Nigeria is presently erecting a factory for the production of lorries and tractors in Bauchi State of Nigeria.

The contract was executed on the 3rd of June, 1978 and the tractors are now working with the Bauchi State Hiring Scheme.

A contract was recently signed in Lagos between **ABR Engineering** and the **Societe Sucriere de Savé** (a Benin-Nigerian enterprise) for the realisation of a complete agro-industrial sugar complex in Savé, Benin near the Nigerian boundary.

This new complex will have a marked social impact on Benin as it will provide employment for the locals and will fill the country's need for sugar as well as export a large amount to bordering Nigerian regions.

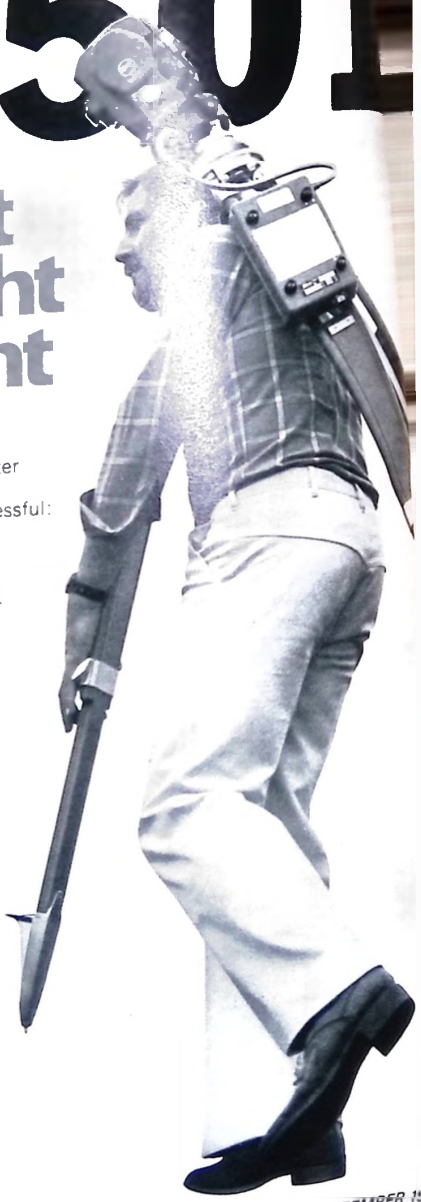
A contract was recently signed in Abidjan between the Belgo-Dutch consortium **ABR/HUA-ENCO** and the **Ivory Coast Government** for a complete agro-industrial sugar complex at Zuenoula which includes a treatment plant with a capacity of 4,000 tonnes of cane per day, a sugar cane plantation of 5,200 ha and the setting up of an irrigation system for 4,200 ha, a dam and the construction of roads and accommodation.

Continued

The Massey Ferguson (Australia) Ltd. 205 cane harvester destined for Nigeria and the Ivory Coast.

DM 501

Compact
Lightweight
Convenient



The new
Kern DM 501 electro-optical distance meter
incorporates all features
which made its predecessor DM 500 so successful:
compactness, low weight,
convenient handling,
attachable to the telescope
of Kern theodolites DKM 2-A and K 1-S.

New

Larger range (2000 m)
Tracking
Automatic signal level control
Fully transitable

Kern SWISS

ATLAS

ATLAS NIGERIA LTD.
SCIENCE DEPARTMENT

4 Labinjo Lane,
PO Box 2120, Lagos

Telephone: Lagos 25917

Contracts

...cts for the supply of 150,000 ballot ...s for next year's elections have been ...ved by the FMG. The boxes to be ...ied to all state capitals will cost over ... Nigerian Engineering Works Ltd. in ... Harcourt will supply 80,000 boxes ... Steel Works Ltd in Ibadan the other ...000.

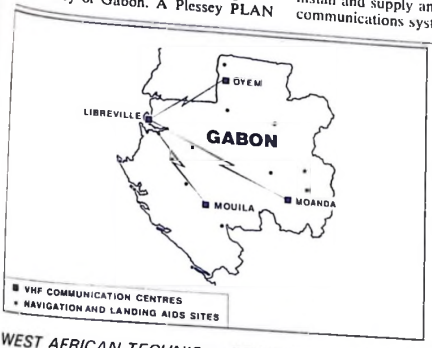
...-compartment 232 cu. m. ...msec ...stream together with air lock ... steel ... building has been ordered ... Hall ...rmotank Products Ltd. for ... ...xfam ...ject in Upper Volta, at a ... of ...4,000. Local farmers are bein... ...isted ...o grow more vegetables and suc... been ...he success of the scheme that co... ...orage ...capacity is now required to ... ...se the ...surplus produce. To facilitate cr... ...on all ...vessels are being numbered on ... ...spatch ...from the factory of **C. Hemmi...** & **Co. Ltd.**

The **Airfield Systems Group** of **Plessey Radar Limited** has been awarded a contract valued at £6.6 million for the extension and modernisation of the civil aviation control infrastructure in the Republic of Gabon. The order provides for the supply, installation and commissioning of over seventeen sites in a three year programme and is part financed by a supplier credit arrangement supported by ECGD.

The securing of this contract, following the recent order for £50 million won by Plessey Radar in the Ivory Coast, is yet another example of market penetration in French speaking West Africa, an area largely uncontested by British companies previously. Together they form a significant breakthrough into an expanding market and negotiations for further major projects are at an advanced stage.

A VHF communications network will be supplied consisting of a number of ground/air telecommunication stations linked to the Libreville communications centre and providing permanent contact between Libreville and aircraft flying over the territory of Gabon. A Plessey PLAN 17/18 Instrument Landing System will be installed at Port Gentil and a number of navigational and landing aids will be commissioned at the other fourteen sites.

Within four days of the contract being signed the first shipment of equipment was already on board an aircraft en-route to Gabon.



The Civil Aviation control infrastructure to be installed by Plessey Radar Ltd in the Republic of Gabon.

The **Quayport** Mediterranean Service to Nigeria has recently received a new contract worth $2,500,000.

The contract, finally clinched after meetings in Paris, was awarded to Quayport on the strength of the company's track record of successful regular sailings to Nigeria over the past 3 years. Under the contract the UK based shipping company will ship over 32,400 freight tonnes of detergent from Spain to Nigeria. The detergent ordered by a major **Nigerian Trading Company** is being manufactured in Northern Spain and transported overland to Barcelona where Quayport vessels will load and ship the cargo to Lagos and Port Harcourt. Starting in mid August there will be up to two sailings per month for the next six months using modern Danish vessels.

The Reiss Engineering Company Ltd., has received an order worth ₦144,000 for two identical steam systems from **Black Clawson International Ltd.** These are to be installed in conjunction with two newsprint machines being supplied by BCI for the Calabar project of the **Nigerian Newsprint Manufacturing Co. Ltd.**

As a result of participating in a trade mission to the Ivory Coast and Nigeria **Warsley-Brehmer Ltd.,** have won orders for £65,000 worth of printing and print finishing equipment.

The Export Development Corporation of Canada (EDC) has granted a $5.7m. (C8m.) award to the **Posts and Telecommunications Corporation** to support a contract awarded to a Canadian firm **Spar Technology Ltd.,** a division of **Spar Aerospace Products** of Toronto who are to install and supply an earth satellite telecommunications system in Ghana.

Airflow Development Ltd., have received an order for 50 portable ventilation units for use in Nigeria. The units are to be used for manhole ventilation during the installation of a new multi-million-Naira telephone system.

One of the 50 portable ventilation units to be imported by Nigeria.

Jonlaw Engineering Co. Ltd., UK, have recently shipped six automatic mains failure generating sets to the **Nigerian Police Force,** as a safeguard against jail break.

Prisoners in rural police stations have been taking advantage of frequent power cuts to escape from their captors, particularly in the early evening, when it takes little more than 30 minutes between sunset and complete darkness.

As the sets were required urgently they were air freighted from Heathrow Airport through **Audnel Freight International Ltd. of Syston,** of the UK.

The shipment consisted of five 31 KVA and one 20 KVA generators, all driven by Perkins diesel engines. Value of the order was £30,000 (₦54,000).

The **NPA** has signed a contract for the supply of three container quayside and handling cranes worth ₦3m. Under the contract the firm **Messrs Reggiane Officine Meccaniche Italiane SPA** of Italy is to supply, deliver and install the three cranes by November 1979. The contract also provides that the firm undertakes to train 24 Nigerian Ports Authority technical personnel in Italy for operation and maintenance of the cranes.

The Nigerian Ports Authority is inviting tenders for hydrographic surveys of the ports, their approaches channels and estuaries administered by the NPA. Closing date is the 30th September.

Wellman Incandescent has been awarded a ₦900,000 contract by the **Nigerian National Paper Manufacturing Company** to supply a Swenson six-body quintuple effect black liquor evaporator for the bleached kraft pulp and paper mill complex at Iwopin.

A ₦1.9 million contract for the installation of electricity and water at the Cross River State's Cultural Centre in Calabar has recently been signed.

For more contracts on construction see page 119.

The new Olivetti A5 electronic accounting system caters for your changing needs

It'll be much more expensive without one

The small to medium size business changes fast and often. So an electronic accounting system that gives you the processing capacity you need, no matter how much your needs change, makes sound common sense.

The new Olivetti A5 electronic accounting system. Modular: you simply add new modules as your changing needs dictate. Modular hardware peripherals, modular software, together they build you exactly what you need.

Program and data load, reading and memorizing are via magnetic card. And to increase input and output capabilities you simply add on a tape reader and punch or use magnetic tape cassettes (ECMA standard).

Easier on the operator, too. A buffered memory store on both keyboard and printer allows her to key in at her own speed without affecting the internal computing and printout. Main memory holds up to 2,000 alphanumeric characters, printout speed is 16 characters per second.

Olivetti A5. No specialist operator training, handles up to four separate documents simultaneously.

Your payroll's anything from around forty to two hundred employees; or you're posting and processing up to 2,000 invoices a month.

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Phone: 3359, 2726

The first example shows the various sections of a properly designed foolscap size customer record file.

The General Information section at the top provides for comprehensive data on the customer's business, size, products used and competitors' products used, contacts and the best days and time to call on each of these contacts.

The 'Call Record" section below this, which is contained on the reverse side of the file, provides for very meaningful information to be recorded on every call the salesman makes on that customer. Note that there are no "Comments" columns. "Comments", as a column heading, is about the most useless thing anyone could ask for. It doesn't really make the salesman THINK before he starts writing.

"What Happened", on the other hand, makes the salesman think just that — and he is more likely to write down something meaningful as a result.

"Aim of Next Call" and "Date of" columns provide the salesman with an opportunity to banish useless courtesy calls forever. The last thing he should do on every call he makes is to establish and agree the objective of his *next* call with that customer, and when that next call should be. He can even make a firm appointment there and then. This is the information that goes in these two columns.

Finally, two columns are provided for

COMPANY | CODE

ADDRESS | TELEPHONE

TYPE OF BUSINESS | TURNOVER

NUMBER OF EMPLOYEES

PRODUCTS USED | COMPETITION

Code	Contact's Name & Initials	Title/Position	Best Day/Time
1			
2			
3			
4			
5			
6			

BUSINESS ANALYSIS

YEAR								
AMOUNT								

CALL RECORD

Date of Call	Contact	What Happened	Order Value Won/promised	Aim of Next Call	Date of Next Call

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Lost" which, if studiously filled ... supply the company, over a period, ... a pretty accurate idea of whether it is ... gaining an edge over the competi... or vice versa.

...ng the files

One of the salesman's most time con... ...ing tasks each week, or each month, is ... through all his customer records ... establish which customers are due for a ... Salesmen with several hundred ... customers and prospects can very easily ... sight of one or two — and another ... bites the dust.

To overcome this major problem, and ... this sorting of customer records com... automatic, advantage can be taken ... those "Aim of Next Call" and "Date" ... columns we have just mentioned.

The Salesman is supplied with a set of 12 ... cards, slightly larger than his ... foolscap customer record files. These index ... cards are labelled January to December. Customer record files are filed within this ... set of index cards, ACCORDING TO THE DATE OF THE NEXT CALL. Thus, as work progresses, all the calls are ... due to be made in any particular future month will become assembled under that month's index card. Each month's assembly of files is filed alphabetically, so that the job of finding a particular file in an emergency is still quick and easy.

At the end of any particular month, the salesman knows that all his customers who are due for a call *NEXT* month will be filed in the one slot. End of problem.

The Salesman can also plan his overall work load one month ahead, by using this filing system. He may find he has time to spare next month, having made all the calls due to be made. Thus, he can plan to increase his prospecting for this next month, or plan a concentrated campaign on a particular industry or product — or take a holiday without denting his order intake graph. Conversely, he may find he has too many customers who need a call next month. Again, he has plenty of time to plan effectively the best solution to this problem. Perhaps some will be phoned first, just to make sure the visit is still necessary. Or perhaps the sales manager will back the salesman up for a week, to help cope with the demand.

These customer record files we have described are expensive, but they do give the very best system a sales force can have. The key effect they have is that they get the salesman chasing BUSINESS — not just chasing customers and prospective customers.

For any sales operation which has to call repeatedly on its regular customers, this system is a must. For the more "one-off" business, similar efficiency may be able to be achieved with a record *card* system, using 8 x 5 cards and the same method of January - December filing. Space for writing is radically reduced, and any correspondence has to be stored separately, but some companies still prefer this method, mainly because they have a high proportion of prospective customers on which their salesmen only make one or two calls before writing the prospects off, and many existing customers who only buy once every five years or so.

The HQ record

We have already said that if the salesmen are made to properly work a standard, company owned customer record system, there should be no need for a separate set of customer records at headquarters. But this some companies still insist upon, and the most effective HQ record is again, to use an 8 x 5 record card, identical on one side to that we have just described, but with the reverse side following the format of the Call Analysis form submitted by the salesmen at the end of each week, which gives full details of all the calls he made during the week and which we discussed fully in the second article in this series.

For HQ to maintain a meaningful record of all customers and prospects, this card needs to be filled out by the salesman, with the basic particulars of the company, business, contacts, etc., when he makes out a new card or file for himself. The HQ card he then sends to head quarters, to be added to the HQ files.

Someone at HQ has to be delegated the task of taking the information off the Salesmen's Call Analysis forms each week, and entering this information on the relevant customer record cards. A wearysome task, but the very minimum amount of work necessary to maintain a complete and up to date record of all customers and prospects.

Specials

As with most parts of a complete sales force control system, customer records may need to be tailor-made for a particular industry with special needs and problems. In previous articles in this series we have discussed some of the particular needs of the Retail Motor Trade. Here is an example of a customer record sheet designed for Fleet Sales of motor vehicles.

These are designed to be stored in an A4 ring binder, alphabetically, or by date of next call, as in our previous examples of files and cards. □

CUSTOMERS RECORD (FLEET AND COMMERCIAL VEHICLES)

CUSTOMER		
ADDRESS		
TELEPHONE NUMBER	CONTACT	POSITION
BUSINESS	SIZE	
VEHICLE PURCHASING POLICY		

DETAILS OF CURRENT VEHICLES

MAKE	MODEL	DATE BOUGHT	WHERE FROM	H P DETAILS	DATE PAID UP	TRADE IN DATE	NOTES

SEE OVER FOR CALL RECORD

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CALL RECORD

	DATE		Industry Category	No Interview	Call on User	Call on Prospect	First Ever Call	Follow up of Lead	Appointment	Proposal Requested	Action Request	Order Secured	Service Call	PRODUCT GROUPS DISCUSSED 0	1	2	3	4	5	6	7	8	9
1																							
2																							
3																							
4																							
5																							
6																							
7																							
8																							
9																							
10																							
11																							
12																							
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PUBLIC RELATIONS IN WEST AFRICA

The following article is an extract from a speech delivered by Mr. Buckle, Head of Public Relations for UAC International, at the FAPRA Conference held in Lagos, earlier this year. In his speech, Mr. Buckle puts forward an objective viewpoint for the Development of Industrial and Commercial Public Relations in West Africa.

THERE WERE no active public relations practitioners in West Africa before the last world war — nearly 40 years ago. In this, of course, Africa was little different from many other parts of the world, for only in America at that time could one find more than a handful of practitioners.

Probably the first steps in promoting public relations as a social activity came from within government circles with the response to an evident need for public information services which arose during wartime, with all the resultant shortages of goods, recruitment to the armed forces and necessary imposition of an austere economic regime by the colonial governments. Ministries of information were established to encourage understanding of and support for the war efforts and they developed very worthwhile operations.

After the war an increasing number of pressures on the public at large, which of course were reflected in political circles, arose from a variety of factors. In personal terms the continuing and in some cases aggravated shortage of goods with consequent deprivation of the necessities of life gave rise to widespread public dissatisfaction and in some instances, unrest: and the growing tide of nationalism with the emergence of active political parties accelerated the march towards independence.

1940's saw beginnings of industrialisation

At this time there was little industry generally but in West Africa in the late 1940s we saw the beginning of industrialisation and the need for government, distributors and customers to be made familiar with the whole nature of this new type of economic development became urgent.

So we saw the slow growth in numbers of public relations practitioners in various types of commercial and industrial companies — almost all foreign with PR managers who were expatriates.

In those days the style of public relations was benign, a strange word but kinder than "negative". There was I think a lack of understanding that in Africa if you have something to say you are expected to say it in an open and direct manner. This attitude sprang from the defensive posture of the commercial and industrial companies adopted in the face of fierce criticism, and so their public relations approach was oblique. However it did embrace an effort to promote wider understanding of the catch words of the day — capital investment, profit, partnership and so on. An outstanding example was the daily strip cartoon published in the leading newspaper in what was then Gold Coast, and Nigeria, by UAC. This was an entirely novel public relations technique that scored a big success.

Private sector turned to the media

In trying to promote a better understanding of their function and their contribution to national progress many of the private sector turned to the media. These took the form of film strips, posters, corporate press advertising, lectures to schools and universities and the publication of booklets. In addition planned programmes were put in hand to inculcate in line management a real understanding of public relations as a management function. In a sense these managers became an extension of an existing public relations department and since, during their normal working life, they had contact with government departments, customers and so on. The work they could do in participating in the public relations of their companies was most important.

The rapid and extensive spread of public relations that followed in the 20 years between 1950 and 1970 was a direct response to the significant changes in the political social and economic patterns of the commonwealth African countries. By far the most important and far-reaching was the attainment of nationhood as independent sovereign states.

There was an understandable lack in many quarters of basic knowledge of business generally. Why did prices differ ? Why couldn't products be made here? Why do profits have to be made? Why isn't a bigger slice of profits ploughed back into the countries? And so on. And perhaps the most difficult of all — why are all the big companies and industries owned by foreigners?

Larger companies in the foreline

The larger companies were in the front-line and quickly understood the need for a greater application of thought and resources to competent and continuous public relations to bridge the gap in understanding and to strive for acceptance by the nations within which they worked. And very soon the expatriate public relations men and women, employed by companies, were replaced by Africans who had learnt their trade. The change was utterly logical.

A basic requirement of an effective public relations practitioner is to be in tune with, and remain in tune with, the total social environment. And so it follows that an African can understand and communicate far more effectively with Africans than an expatriate could ever hope to. And from those beginnings I have watched with hope and pleasure the growth in numbers, stature and performance of Africans now in public relations practice. Professionalism is promoted and aided by the national PR associations in Ghana and Nigeria. On the work of these associations supported by the FAPRA will rest the future development of standards of ethics, practice and knowledge. IPRA will help in any way possible.

Policy objectives before independence

Before independence the policy objectives of a company reflected in their public relations work would be

a) To demonstrate an ethical approach to business
b) To show proper concern for the welfare and interests of employees and customers
c) To be shown to have a long-term interest in the country as opposed to being a get-rich-quick and get-out operator.

and in addition to help broaden understanding of the importance to the national economy of efficient and successful commercial and industrial operations.

There was the beginning of an understanding of the need to wholly

Continued

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grate with the host country and this came the paramount overall public relations objective following a speech made by the then prime minister of Nigeria, Alhaji Tafawa Balewa in 1964 when visiting the Ivory Coast.

What he said in effect was "African countries expect foreign investors to fully integrate their operations with the life aspirations and ambitions of the government and people." Clearly, integration had to grow from the attitudes of management and the commercial and social policies of the companies and so to the original four objectives I mentioned earlier were added

i) A planned indigenisation programme to train and give greater experience to African managers to enable them to take over from their colleagues
ii) The establishment of national distribution networks operated by African distributors
iii) A withdrawal from those types of businesses into which indigenous entrepreneurs were moving

These objectives were integrated into public relations policy and so the public relations front widened. Conversely the target 'publics' were reduced, and the style of public relations changed. A realistic assessment of the situation of commerce and industry revealed that the groups of people who could influence the development or otherwise of the private economic sector, lay within the legislative machinery of the state, the office holders within that machinery, their advisers, and of course the executives of the mass media. Without 'blanket' coverage of the whole general public which was not possible with the limited audiences of the mass media, the only alternative but complementary channels of communication available to the public relations manager were provided by the leaders of public opinion.

And so the style of public relations changed with the change in objective from trying to inform on the widest possible front, to trying to inform these identifiable groups.

The public relations point to be made and the manner in which they were transmitted were related directly to the upgrading of the target audiences.

Need to show social responsibility

Concurrently with the need to establish the national economic importance of commerce and industry and its integration with national development plans grew the need to show greater social involvement or as it is more commonly known nowadays, social responsibility.

This was, so to say, anaother stage of integration and equally as important as the others.

It has been pursued in many sectors of social life and it is vital in helping to demonstrate that operators in industry and commerce are just as surely citizens of the country, although not always nationals, as any private citizen, with the same desire and determination to participate in the life of the community as is possible.

Whilst one could say that what is expected of commerce and industry in this particular field, is sometimes excessive and could become almost punitive, it is realistic to acknowledge that a sole motive of achieving a profit is no longer the acceptable role of business in society. There has been a great deal written and said on this subject but little light cast on what has in many cases been a spontaneous response to their own consciences and understanding of their impact on the community by responsible companies.

Particularly in Africa this has been true and I believe that a strong sense of social responsibility existed many years before it became the fashionable catchword in America and subsequently Europe. But it is an attitude of business that is here to stay, whether spontaneous or induced by pressure, and no leader in commerce or industry in Africa would neglect to take it into account in framing the policy of his company.

The greater penetration and effectiveness of public relations in Africa is due to four main factors.

First an acceptance of public relations activity as a legitimate corporate function contributing to better collaboration between legislators, investors and consumers through the creation of closer mutual understanding.

Secondly the refinement and greater professionalism amongst the practitioners in creative thinking and execution of plans which have the national interest at the heart of their objectives.

Thirdly, the great and rapid expansion of the mass media which has facilitated the promulgation of the public relations programmes of the wealth creating sector of African nations.

Leap forward provided by invention of transistor

In this regard the invention of the transistor radio provided a great leap forward. Cheap portable and reliable, it rapidly widened the listening audience and was quickly matched by an expansion of the transmitting facilities. With broadcasts in several different languages, radio services have become the most important of the mass media.

But there has also been growth in the reading public, and although not all are hugely successful due to poor editorial or production quality, newspapers have increased their circulation and readership.

Weekly newspapers and periodicals appealing to different readerships have also made their mark.

If I mention television last, it is because the cost of buying or renting a set restricts the audience to a small section of the public. But in some countries additional audience is tapped through communal television centres where the general public can view the programmes. Television is of course a medium of great importance with a remarkable impact, and public relations practitioners should ensure they understand how it can best be used in their planning.

And then, forthly the establishment of centres of learning in the profession of public relations which are producing the next generations of practitioners who will have an awareness of modern techniques that can be applied to gain greater penetration, and an awareness of ancillary sciences such as the behaviourial sciences which will give them a greater understanding of likely human reaction to their activities and therefore a better platform for planning.

The future

I have been talking about the development of public relations in industry and commerce, but what about the future? anticipate a continuing expansion of public relations work in these two sectors of the economy, because they must be seen and accepted as integral parts of the whole national development. A sound working relationship between companies in these areas, with government, ancillary service companies and the customer, is basic to progress. And I believe public relations is accepted as a legitimate activity contributing to the achievement of such a relationship.

But this does demand that public relations as a contributory social activity continues to develop and deepen its impact in all levels of planning. So far as executive management in industry and commerce is concerned, there must be an automatic involvement of public relations advice in their counsels which lead to decision taking. The all-round effect of a business decision is not confined to profitability, return on working capital, or inluence on share prices; nor in human terms is it confined to shareholder benefits of customer acceptability. Its nature impinges on government, competitor and general public attitudes and as such it must be evaluated in comprehensive public relation terms.

To be able to perform this vital function and to be recognised as competent to do so requires that everyone in public relations is continuously concerned with improved levels of knowledge and expertise, backed by the reputation of their own national associations and even of international public relations associations.

Public relations is not only a professional practice but is also an attitude of mind — which must through performance and acceptability be inculcated in all quarters where decisions are taken which affect the lives of people.

In conclusion, I believe that public relations in West Africa is an important factor in the growth and preservation of national unity and I'm certain that the contribution made by the practitioners in commerce and industry will continue to be significant and of assistance in this common and all-important objective. □

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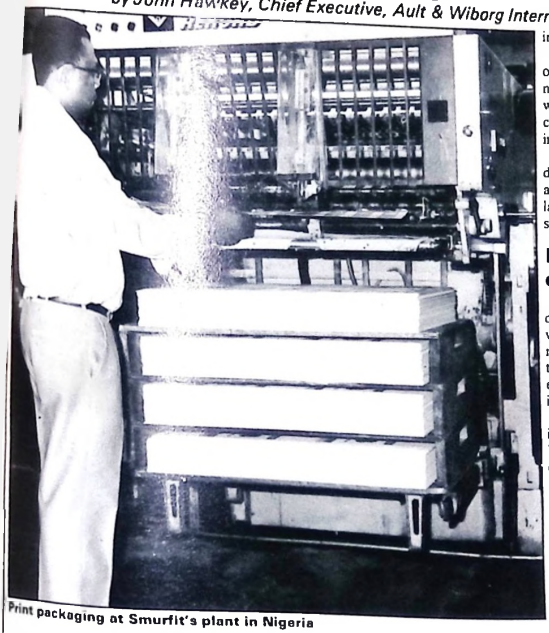
by John Hawkey, Chief Executive, Ault & Wiborg International Limited



Print packaging at Smurfit's plant in Nigeria

AS THE domestic market expands in West Africa and the purchasing power of the man in the street increases, a definite demand for promotional packaging of every day items makes itself felt.

At first, imported bulk supplies are packaged using imported cartons and other printed material. These imports in turn create their share of any balance of payment situation and it is usually only a matter of time before local companies are establishing carton producing firms to meet this initial simple supply problem.

However, this obviously develops into a wider potential and although usually restricted at first to consumable such as tablet soap, soap powders and detergents it is soon appreciated that the packaging techniques can be applied to foodstuffs and a whole host of other items.

In parallel with the market development lies a technological improvement as printers move from simple sheet fed operations which have relatively limited production capabilities, to highly sophisticated production lines using reel to reel machine with in-line creasers and cutters to produce, at high speeds and capacity, packages and cartons.

In turn, this also calls for a sophistication of materials used and from the sheet fed examples, we see rapid development into cellophanes, polythene, polethelyne, polypropylene glacines and foils by flexographic and photogravure printing.

This produces items such as sweet wraps, bread wraps, biscuit packets, and into the even more sophisticated area of heat sealed food packaging.

In turn these require outer containers for bulk carriage and usually calls for corregated Kraft cartons again produced on highly technical equipment such as printers' slotters on a letterpress or flexographic system.

Hand in hand with the acquisition of machines and printing expertise goes a need for ink technology. This is particularly important in relation to food packaging in tropical climates.

There is an obvious need for the inks to have high light fastness coupled with non-toxicity, in accordance with local food and health regulations. In addition, they of course, must print at very high production speeds, often in a six colour sequence capable of artificial drying to allow speed up of production through hot air, u.v. and infra-red curing systems.

At first the inks are imported. In terms of the home producer of packaging this necessitates long term production planning with ink testing and formulation being carried out thousands of miles away in the ink manufacturer's factory.

This cannot overcome the inevitable day-to-day problems of print production and can cause serious hold-ups through lack of immediate local response and supply.

Local manufacture of original ink materials

As with the paper and board, where the development is entering yet another stage where these materials are now manufactured locally from imported pulp, there are apparant moves to investigate and establish the local manufacture of original ink materials.

A notable example of this is to be found in Kenya and the Sudan where Ault & Wiborg International Limited, have co-operated with indigenous companies to establish ink factories manufacturing to the original European standards.

This normally involves technological know-how agreements for the control of formulae and raw materials.

A similar development is now well advanced in Nigeria where Roinks of Lagos have only recently commenced trial manufacture.

It can reasonably be expected that similar opportunites will occur in other West African countries such as Ghana and the Ivory Coast.

Considerable progress with metal, plastic and glass

Another major area in which considerable progress is being made in the packaging field, is where metal, plastic and glass containers are concerned.

Externally, the titling and sales message on items such as beer cans, soft drinks, collapsible tubes, crown cork, pharmaceuticals and foodstuffs is achieved by a printing process whilst the insides may be coated in protective laquers.

Collectively these advances provide an ample return to the countries concerned, firstly by the saving of hard currency on budget expenditure and at the same time the establishment of new industries.

This not only creates employment for large numbers of skilled and semi-skilled workers but also creates a vital opportunity for the permanent establishment of a higher level of skills and training which will ultimately be reflected in higher standards of living. □

The Hercules

For nations and airlines alike, the twin-engine Hercules, the L-400, offers a number of important advantages.

The L-400 is the low-cost way to replace smaller, aging airlifters. However, it's big and flexible in payload, able to haul loads such as 22,500 pounds for 550 nautical miles —or 15,000 pounds for 1,400 nautical miles.

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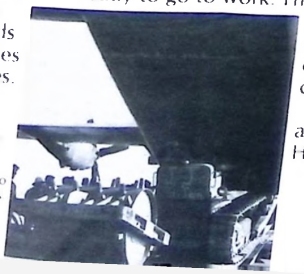

The L-400 has the same big cargo compartment as the 4-engine Hercules.

The twin Hercules and the four-engine Hercules have a lot

twin. Low in cost. Big in payload. Flexible in mission.

more in common than giant cargo capacity. The L-400 can use dirt, gravel, sand and snowy runways. Most of the avionic systems are the same. And then there's the famous Hercules reliability, plus the fact that most L-400 parts are interchangeable with those of C-130 or commercial Hercs. It's also comforting to know that the worldwide Hercules logistics system is in being. After all, 43 nations have chosen Hercules.

This new member of the Hercules family will be produced on the same production line as the big, four-engine Hercules. Lockheed proposes to authorize production of the twin-engine Hercules next year.

For more information on the many ways the L-400 can help, contact Director of International Sales, Dept. 69-50, Zone 1, Marietta, GA 30063, U.S.A. Telex: 542642 Lockheed Mara.

Lockheed L-400 Hercules

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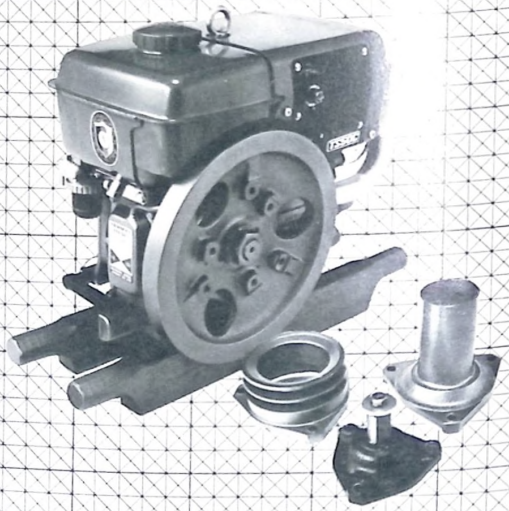

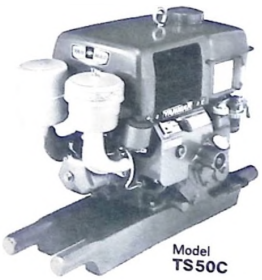

Model TS50C

Yanmar TSC diesel. Eight engines, 4 to 18 horsepower. And virtually no limit to the ways you can put them to work. Because we designed the TSC to let you select the coupling system that meets your drive requirements. Belt. Pulley. Direct. You name it.

Coupling versatility. It's an important reason behind the TSC's worldwide popularity — 1,655,000+ units delivered since 1969. Some of the others: Ease of operation and maintenance. Outstanding fuel economy with Yanmar's swirl precombustion chamber system. Rugged, reliable running over years of hard use, under any condition. And a complete supply of parts and backup services available through Yanmar's 130-nation network.

The versatile Yanmar TSC. With 1,655,000+ coupling requirements met already, we're ready to meet the most important requirements of all. Yours.

TSC—the do-anything diesel powerpack

YANMAR DIESEL ENGINE

YANMAR DIESEL ENGINE CO.,LTD.

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HUNGARIAN TRADE

Supplement to West African Technical Review

September 1978

In this supplement:
Hungary's trade with West Africa
Destination Report: Budapest
Hungary's technical achievements
can help West Africa

For an industrial name development is the game

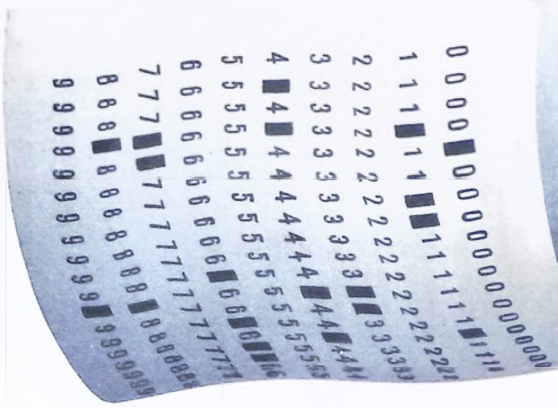
Hungary's biggest industrial enterprise is aware of the fact that its products of today will be judged tomorrow.

As a result of the coordinated activity of ten factories, three scientific institutes and an independent foreign trade company we are present on the world market with more than 3000 products.

Our main products

- Complete factory equipment, tube factories, welding electrode factories, steel tubing factories.
- Hot rolled, cold drawn tubes and electric welded steel tubes, tube constructions, gas containers.
- Hot-rolled steel semi-products, forged and pressed goods, steel and iron castings produced with different technologies.
- Cold-rolled electrotechnical steel strip of silicon alloy, with soft isotope-magnetic character.
- Semi-products of copper, bronze, brass, German silver, nickel and iron based alloys. Materials for the instrument and telecommunication industries.
- Machine-tools, column and radial drills, consoled and length milling machines, with traditional or punch-card and numerical controls.
- Special single unit machines: high-precision cog-wheel and threadgrinding machines, numerically controlled shortpurpose machines, machining-centres.
- Machines for the ready to wear industry: cutting out machines, ironing machines, industrial rapid sewing machines, dotting and locking machines, button, clip and hook sewing machines etc.
- Rubber vulcanizing and synthetic material presses.
- Up-to-date tube and bar pointing drawing and straightening machines manufactured under licence from Kieserling.
- Special telecommunicational machines, reel-winding, cable cutting and cable-shaving machines, vacuum impregnating equipment.
- Garage equipment. Auto-electric test-benches, engine testing wheel balancing machines, car-washing and drying equipment.
- Power-transmitting, mains branch-off transformers, oil-transformers with cooling tubes and radiator, dry-transformers.
- Bicycles according to sport and touring requirements.

These products materialize not only production experience, up to date technology and continuous research and development. Something more. The production philosophy of our 30.000 people: what we manufacture today will influence the quality of tomorrow.



Csepel

IRON AND METAL WORKS

H-1751 Budapest
P.O.Box 93
Hungary

Partners in development

IT WAS not until 1964 that a commercial section of the Hungarian Embassy was opened in Lagos and since then trade between the two countries has steadily increased. It was in the sixties that fashionable Nigerians were attracted to the colourful Hungarian cotton goods while acquiring at the same time a taste for the same country's popular 'Golden Pheasant' tomato paste.

The trade has now diversified, particularly in the pharmaceutical field in which a joint Hungarian-Nigerian enterprise, Imarsel Chemicals Ltd., are now supplying the 80 million population with drugs to the value of more than $5 million annually, a valuable contribution to the expanding health service of the Federal Republic of Nigeria.

On a smaller scale are two Lagos-based enterprises, Fertesco Industries Ltd. and the Nigerian Mapping Co. Ltd., the former making raincoats and ceramics, the latter making road maps and street finders of the capital as well as other towns.

Hungarian President Pál Losonczi (centre) visiting an experimental farm at Kadawa, Kano State.

Town planning

In Kano the Tesco-Közti Consulting Engineering Bureau has now been operating for nearly ten years on town planning developments.

Two years after the opening of the commercial section of the Hungarian Embassy a Trade Exhibition was held in Lagos which proved so successful that it was followed by others in 1971 and 1976, while the first Lagos International Trade Fair was opened in 1977, with the Hungarian Pavilion being awarded a Gold Medal.

Another Hungarian Exhibition is being held in Lagos from September 28 to October 5.

Official visit

These activities stemmed from the visit of the Hungarian Head of State H. E. Pál Losonczi to Nigeria in 1973, giving a new impetus to the development of economic and trade relations between the two countries. It was during this visit that a new trade agreement was signed between the Federal Republic of Nigeria and the Hungarian People's Republic.

As the two countries are geographically very far from each other and the two peoples are not sufficiently acquainted with each other's economic development, with the possibilities of a fruitful and mutually advantageous co-operation, the Hungarian foreign trade authorities and trade promotion organizations decided to organize a large scale Trade Exhibition in Lagos, as early as in 1966. Displaying the latest achievements and products of the Hungarian industry, the Exhibition proved to be a success.

Products on show

The first Hungarian Exhibition was followed by equally successful ones in 1971 and in 1976. When, in 1977 the First Lagos International Trade Fair was organized it was natural for the Hungarian organizations to contribute to its success by participating in it.

Now there is a constant exchange of business delegates between the two countries. As a result of the work of these fact-finding missions the outlines of the most important territories of economic co-operation drawn up. The decisive factor in determining the spheres of co-operation was the economic development plan of Nigeria. From the Hungarian point of view, preference is given to the co-operation in the following fields:

- Health;
- Education;
- Food industry.

Summing up the results and perspectives of these three major items of co-operation, we have to mention the 52 millions Sfrs. line of credit accorded in 1974 by the government of Hungary to Nigeria for the purchase of hospital equipment, educational installations etc.

Health

Since 1975 MEDICOR Works the giant Hungarian enterprise for the production of medical and surgical equipment has signed contracts with several Nigerian states for the supply of hospital apparatus to the value of more than 30 million U.S. dollars. According to the newest information got from Medicor the state of Oyo is interested in purchasing complete hospitals tor a sum of about 11 million dollars.

Continued

HUNGARIAN TRADE

Education

The current five-year development plan of the Federal Republic of Nigeria envisages a rapid industrial development both in the heavy and the light industry, together with the modernization of agriculture and food industry. To reach these goals more technicians and skilled workers are needed. This is why education is one of the priorities of the country's economic plan.

In December 1977 a contract was signed between the Nigerian Federal Ministry of Education and METRIMPEX Hungarian Foreign Trade Company for the supply of all the equipment of the newly created IDAH Technical Highschool, for an amount of nearly 10 million U.S. dollars. The Hungarian party stipulates the educational programme and 8 Hungarian professors shall act as technical advisors for some years.

Another Hungarian company, TECHNOIMPEX is having negotiations with the Federal Ministry of Education as well as with the Ministries of Education of several States. This Company is supplying equipment for all kinds of secondary technical schools and professional training centres.

The Hungarian party hopes to contribute to the success of the Nigerian plans aiming at the rapid development of education in Nigeria. Both METRIMPEX and TECHNOIMPEX can rely on the capacity of numerous Hungarian design offices, industrial firms, they co-ordinate the work of tens of thousands Hungarian working people for the success of the co-operation between the two countries.

Agriculture and food industry

The supply of the 80 million inhabitants of Nigeria with adequate quantity of food is a daunting task as the demand for better nutrition grows. The authorities of the Federal Republic of Nigeria launched the famous "Operation Feed Yourself", calling for a greater activity of the rural population in growing locally an ever increasing part of the agricultural produces. The Federal Government encourages the States to set up modern industrialized farms and food industry. Having got acquainted with Hungarian machinery for food industry, the Nigerian authorities called for Hungarian co-operation. The first step in the Hungaro-Nigerian co-operation in this field was the contract signed by the Government of Kano State with KOMPLEX Hungarian Foreign Trading Company for the supply of an abattoir in Kano. The six million U.S. dollar worth contract is under execution.

The opening of Nassarawa Hospital, Kano State, by President Pál Losonczi of Hungary.

Negotiations

KOMPLEX is carrying on negotiations with the Government of Lagos State for the supply of the equipment of an abattoir of a much greater capacity. The Hungarian offer — now under study — is of a value of 23-25 million dollars.

The same KOMPLEX Foreign Trading Company offered the creation of so-called "integrated tomato processing plants" to several States of the Federal Republic of Nigeria.

Future prospects

These are the priorities of the Hungarian-Nigerian economic co-operation. New fields of co-operation are: bicycle assembling, garment-making, electric bulb and fluorescent tube manufacture and river navigation.

Trade being a two-way traffic, it is a matter of course that Hungary does her best to buy from Nigeria as much as possible, particularly tin and cocoa.

In 1977 the total volume of trade between the Federal Republic of Nigeria and the Hungarian People's Republic was a little more than 56 million dollars (34 million dollars for the Hungarian export, 22 million dollars for the Hungarian import).

Taking into consideration the different fields of co-operation planned between the two countries a yearly growth of 15-20 per cent can be expected in the volume of trade. To facilitate the co-operation between the two countries the Hungarian Government envisages to grant a new credit to Nigeria of an amount of 40-50 million dollars for the purchase of hospital equipment, educational installations and food processing plants. □

Hungarian Trade Show Exhibitors

Exhibitors at the Hungarian Trade Exhibition in Lagos from September 28 to October 5 will include: Hungarian Shipyard and Crane Factory, Mom, Hungarian Optical Works, Moguert, Ganz, Mavag, Metrimpex, Chemolimpex, Ferunion, Hungarocoop and Hungarofruct.

HUNGARIAN TRADE

The ... an Parliament Building on the banks of the Danube

Making the most of your business trip to Hungary

TRADE relations between Hungary and the African countries are constantly developing. More and more African businessmen visit Hungary in the heart of Europe.

If you are going to visit Hungary, the first thing to do is to contact the Lagos Embassy of the Hungarian People's Republic. Commercial Section, 20 Ademola Street SW, Ikoyi, Letters: P.O.B. 133, Phone: 52-586, 55-439, Cables: Hungexport, Telex: 21459 DILAGS.

Commercial sections of the Hungarian embassies provide up-to-date information on Hungarian economy, foreign trade network, and on market conditions. Useful booklets are "Directory of Hungarian Foreign Trading Companies", and "How to Trade with Hungary".

Information

Other booklets are published regularly by the Hungarian Chamber of Commerce, which provides further assistance in establishing contacts. The address is: Hungarian Chamber of Commerce, Budapest, V. Kossuth Lajos tér 6-8. Letters: H-1389 Budapest, P.O.B. 106. Phone: 314-155, 125-380. Telex: 22-4745.

Travel documents

The necessary visas for entry in Hungary are issued by the consulates of the Hungarian People's Republic. Visa forms may be requested from the consulates by post and returned, filled in. Visas may also be obtained at Budapest-Ferihegy Airport.

Accommodation

It is advisable to book well in advance because in Budapest hotels are practically booked out from April to October. The most important Budapest hotels are members of international booking systems: Hotel Duna Intercontinental of the IHC, the Budapest Hilton Hotel of Hilton and the Hotels Gellért and Volga of the Steigenberger chain. Should you not succeed in getting a hotel accommodation, you may rent a private room in Budapest and as in all bigger towns.

Flights to Hungary

The journey from Lagos to Budapest is not a short one. The detailed possibilities are the following: (All data is valid until October 31, 1978. All times are given in *local time*.)

Tuesday: Departure Lagos 12.05 p.m. by UTA 782. Arrival Paris, Charles de Gaulle Airport at 20.30 p.m. **Wednesday:** Departure Paris, Orly Airport, 13.15 p.m., Air France 559. Arrival Budapest 14.25 p.m. **Wednesday:** Departure Lagos 10.45 a.m. by Swissair 253. Arrival Zürich 17.55 p.m. Departure Zürich 19.25 p.m. by Swissair 468. Arrival Budapest 20.55 p.m. **Friday:** Departure Lagos 23.55 p.m. by UTA 756. Arrival Paris, Charles de Gaulle Airport 6.50 a.m. Departure Paris, Orley Airport 20.15, by Air France 559. Arrival Budapest 21.25 p.m. **Saturday:** Departure Lagos 1.50 a.m. by Aeroflot 422. Arrival Moscow 15.45 p.m. **Sunday:** Departure Moscow 13.35 p.m. by Malev 101. Arrival Budapest 14.05 p.m.

Climate and Clothing

Hungary's climate has an average annual temperature of about 10 degrees Centigrade. (The coldest month is

Continued

HUNGARIAN TRADE

...mary with an average temperature of ... degree to 4 degrees Centigrade, the ...rmest month is July with a medium ...mperature of 18 to 23 degrees ...ntigrade.) But do not let ...verages ...ceive you — it could happen ...at you ...re greeted by a downpour on ...nol day ...n July. So do not forget to ta... a light ...raincoat and one or two ...armer ...jumpers in summer and in ...nter a ...warm overcoat.

Clothing habits are simil... ...hose of ...ther European countries. ...festive occasions, at the opera, ...re and restaurants at night men ...ly wear dark suits, white or ...loured shirts and — except for the ...st summer months — ties.

The same relates to ladi... ...fternoon, cocktail or evening dress ...e widely worn.

Language

Language difficulties should not bother you when starting correspondence with a Hungarian company or while travelling in the country. Although the Hungarian language belongs to the Ugrian branch of the Finno-Ugrian language-family and is extremely difficult to be learned by foreigners, visitors coming from abroad are easily understood: in hotels, major restaurants, and, of course, foreign trading companies, world-wide languages are spoken.

The Hungarian State Opera House in Budapest.

Currency, Money Exchange

Travellers' cheques, as well as cash can be exchanged at the branches of the National Bank of Hungary, and the National Saving Bank (abbreviation: OTP), at travel bureaus, at exchange counters on the border, in hotels, railway stations, the airport, etc.

It is advisable to keep the receipts given at the exchange — since they may have to be produced at occasional checks on the border when leaving the country. There are numerous stores, restaurants, hotels in Hungary that accept the various credit cards (American Express, Carte Blanche, Diners Club, Eurocard, Universal Air Travel Plan).

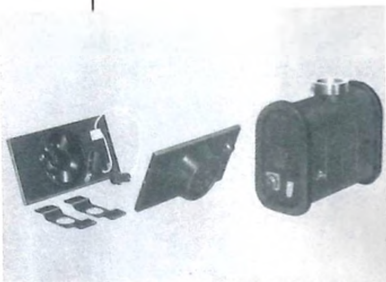
Leisure Time

There are plenty of sights and performances to enjoy in Hungary.

The greatest attraction, of course, is Budapest itself with its population somewhat over two million and its pulsating life. Here there are two

Continued

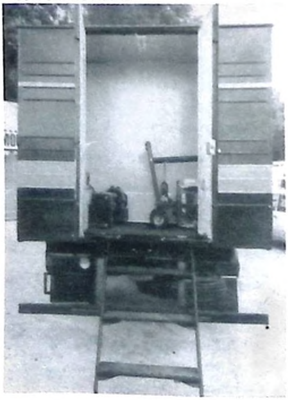
LINE RADIATING X-RAY APPARATUS FOR NON DESTRUCTIVE TESTING



MXR X-RAY CENERATOR

SELT-CARRIER X-RAY LABORATORY

SUPPORTING FRAME



GENERATOREN							
Typ	Röhrentyp	Optischer Fokus mm × mm	Ausgangsdaten	Durchleuchtungsfähigkeit	Gewicht kg	Abmessungen mm	Bemerkungen
MXR—100	Direktstrahler	1,2 × 1,2	100 kV/5mA	50—100 mm Al	19	265 × 145 × 245	
MXR—150	Direktstrahler	1,8 × 1,8	150 kV/5mA	0—45 mm Fe	22	290 × 145 × 230	
MXR—200	Direktstrahler	2,3 × 2,3	200 kV/5mA	40—60 mm Fe	27	340 × 155 × 265	
MXR—300	Direktstrahler	3,5 × 3,5	300 kV/5mA	72—100 mm Fe	55	475 × 190 × 395	
BX—150	Direktstrahler mit 2 Fokussen	0,8 × 0,8	150 kV/2mA 5mA	0—45 mm Fe	48	290 × 370 × 480	
BX—150/1 Durchleuchtungskabine	Direktstrahler mit 2 Fokussen	0,8 × 0,8	150 kV/2mA 5mA	0—45 mm Fe	180	875 × 727 × 1350	[illegible]
BX—150/3 Durchleuchtungskabine	Direktstrahler mit 2 Fokussen	0,8 × 0,8	150 kV/2m 5mA	0—45 mm Fe	750	1120 × 2000 × 2250	[illegible]
KXR—200	Rundstrahler	3,9 × 3,9	200 kV/5mA	35—44 mm Fe	45	□300 × 880	
KXR—300	Rundstrahler	4,8 × 4,8	300 kV/5mA	57—80 mm Fe	85	□300 × 1140	

TRAKIS BUDAPEST

Manufacturer: TRAKIS 1078 Budapest, Nefelejcs st.39.
Telex: 22-4730

Exporter: MEDICOR WORKS 1132 Budapest, Röntgen st.11-13
Telex: 22-6348

operas: the Opera House and the Erkel Theatre. Book your tickets well in advance. But in Budapest during the summer the theatres are closed, although you can still enjoy open-air performances which can be understood without the knowledge of the Hungarian language.

Sight-seeing

Sight-seeing tours in Budapest are organized by the travel agencies IBUSZ and BUDAPEST TOURIST between May 1st and the middle of October — by buses — daily at 10 o'clock a.m., starting from Roosevelt Square. During the autumn and winter the buses are run according to need. The travel bureaux mentioned above will inform you on the details.

The round-trips usually take you to the following places: the Mátyás Church and the Fishermen's Bastion on the Buda Castle Hill. On the way to the city the buses usually stop at one of the downtown churches (St. Stephen Basilica, Downtown Parish Church, Franciscan Church) as well as in the shopping streets.

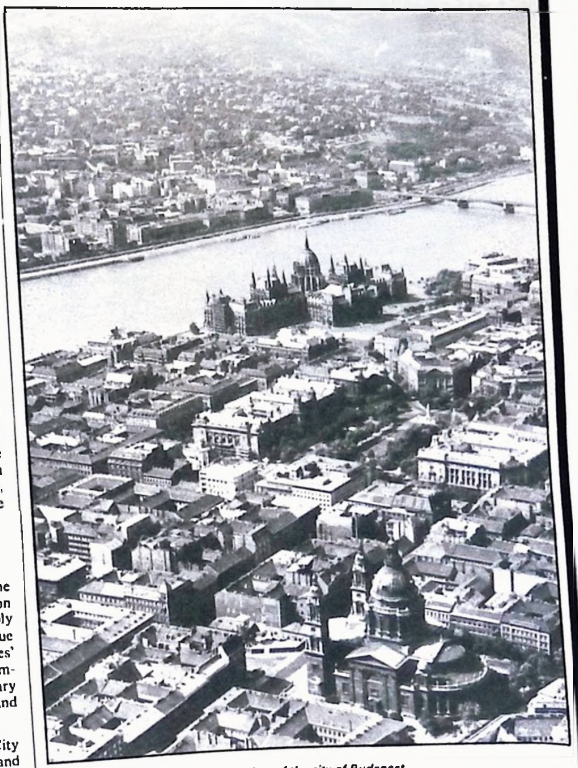
Parliamentary view

The tour then proceeds through the government district with a brief view on the Parliament. Next you are probably taken along Népköztársaság Avenue past the Opera House to Heroes' Square with the monument commemorating the millenium of Hungary in 1896, the Museum of Fine Arts and the Art Gallery.

The ride continues alongside City Park, finally through Rákóczi and Kossuth Lajos Streets across the Elizabeth Bridge to the Liberation Monument on top of the Gellért Hill where you certainly are going to enjoy the view of the city, and, in case you have a camera, the pictures taken there, too.

If you prefer to walk, it is worthwhile to return to the Buda Castle Hill, to stroll through the narrow winding streets and to visit the Castle Museum with relics and documents relating to the history and art of the capital from ancient times to the present day.

You should also visit the Museum of Fine Arts (Heros' Square) with its fine collection of Spanish masters (Greco, Goya, Velázquez) as well as works by Tiziano, Raphael, Veronese, Tintoretto, Brueghel, Rubens, Van Dyck and Dürer.



An aerial view of the city of Budapest.

In the Country

In summer it is nice to make an excursion to Lake Balaton. A motorway leads directly to the southern shore. You can take a ferry ride from Szántód to Tihany and visit the Abbey with its baroque style church. You will never forget the view of the Balaton.

Relaxation

Some further suggestions how to relax: in Budapest you could visit one of the many thermal baths. If possible, take a trip to *Pécs*, a beautiful city in Transdanubia, with Roman and Turkish relics and an imposing cathedral. *Szeged* (Southern Hungary) is especially interesting in July and August when Open-Air Festivals are on the programme. One the way there one passes through *Kecskemét*, a town known for growing the most delicious apricots; the delicate "barack pálinka" (apricot brandy) is produced here, too. A few kilometres off the main road the Bugac Puszta can be reached (horseback-riding, horse-drawn carriages, grey Hungarian herds).

To do all or some of these you probably will need a car. In order to rent one, contact Volántourist's Rent-a-Car Service (Budapest, IX., Vaskapu u.16., Phone: 142-819.) □

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Telex: 22-5877

Stressing the need for prefabrication

LARGE-SCALE prefab[rication] was introduced in Hungary [to] meet the demand for housing after [the] devastations of the Second World [War].

In the 1950's, alongside [the] basic reinforced concrete prod[ucts] such as floor beams, railway sleep[ers] and power line poles which were seri[ally] produced, the dominant building met[hod] had been the in-situ prefabrication [of] large panels.

This method, especiall[y] the erection of major industrial [e]stablishments, brought forth numerous [new] solutions, outstanding even on an international scale and now Hungary is using its expertise in West Africa and in many other countries.

The system of industrial prefabrication and precast concrete construction still in widest use, took shape in the 1960's. It is characterised by modular co-ordination in every field of buildng and civil engineering, the standardization of the serially produced structural units and the development of their mass productin.

The large-scale manufacture of structural elements for building and civil engineering works was concentrated in a major enterprise, the Concrete and Reinforced Concrete Works (BVM for the Hungarian initials). Hungary's state and co-operative building companies as well as private builders in the country at present use BVM's products to assemble buildings or civil engineering objects for a variety of functions. Centralized standardization and BVM's active marketing and promotion policy ensure their wisest application.

Ten large centralized prefabricating plants (house factories) belonging to the local building contracting companies form the basis of the prefabrication of large panels for housing construction.

The prefabrication of shorter runs or individual structures and architectural units in auxiliary plants is undertaken by the building contracting companies and these latter are responsible also for the final assembly and completion of the objects.

The most important contracting company, having its own prefabricating auxiliary facilities, is the No. 31 National Building Enterprise. This company takes care of the prefabrication and assembly of the most significant industrial establishments in Hungary. The enterprise can boast of noteworthy success also in the production of large-span prestressed TT and T floor slabs.

The frame of this modern hotel was built in precast concrete manufactured by a special process developed by UNIVAZ.

The largest Hungarian industrial prefabricating plant is BVM, the concrete and Reinforced Concrete Works. In its fourteen branches BVM turns out three million tons of prefabricated concrete structures annually (sixty per cent of the reinforced concrete structures are pretensioned). BVM's Kunszentmárton Factory (Central Hungary) produces six thousand tons of machinery for prefabrication, and steel forms for both the domestic and the foreign markets. During the thirty years of its existence BVM developed numerous technologies and structures which were granted patent protection.

Multi-storey Frames

Another centralized prefabricating factory engages in the manufacture of standardized and modular single — and multi-storey frame structures which are also in extensive use in Hungary. The light-weight UNIVAZ system which can be used to advantage in buildings up to ten storeys high and produced in sizes between 2.40 and 9.00 m. with 60cm. modular steps and spans to suit the job, leave the factory at a rate of 560,000 square metres a year.

Lively demand justified the elaboration of a high-productivity closed-cycle production technology using chain con-

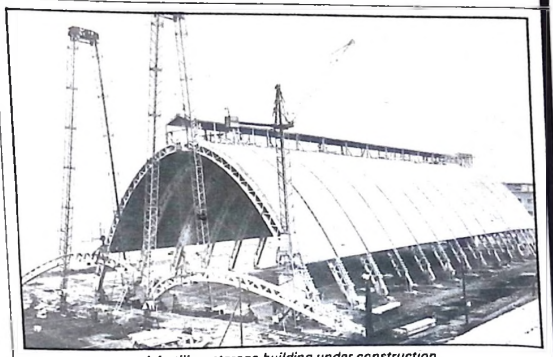
Continued

Production of pre-stressed floor beams at the BVM Kazincbarcika factory.

...ajors. A system of modular, thermally ...sulated wall panels ensure variety of ...form and of the façades.

Special technologies have been devised also for the production of hand ...ize blocks for one-family ...es and blocks of flats. This techno...gy, with the use of a cable conveyor ... equally suitable for the manufactu... of hand-size blocks, floor blocks, ti... ...d slabs for road building and ...draulic structures.

For the production of ...stressed floor beams a multi-pu... closed cycle roller-train techn...y is at present being developed. ...combination of prestressed floor ...ms, floor blacks and masonry bloc... provide for a low-cost building meth... without the need for machines.



A fertilizer storage building under construction.

New Technology

The concentration of the prefabrication of civil engineering objects gave rise to excellent new patented systems and technologies in Hungary. The development of a new system of building reinforced concrete elements for tunnels was instrumental in the elaboration of an industrial method for the construction of railway and road tunnels, and urban subways. It lends itself particularly well for shield tunnelling, even in loose sedimentary or water logged subsoils. Simple hinged joints enable easy fitting and make for thin walls. Stability is ensured by a ring assembled of high-stability reinforced concrete members combined with the injection of the surrounding soil mass.

In the building of the Budapest Metro reinforced concrete tunnel liners with an inside diameter of 5.10m. and 20cm. thick walls of B 500 grade concrete were used. For the main tunnel of the Prague (Czechoslovakia) underground the same liners were exported from Hungary while for the stations, we supplied special ribbed liners with an inside diameter of 7.80m. and 50cm. walls. For the Belgrade (Yugoslavia) railway tunnel the Hungarian prefabricating industry exported liners with 6.70 m. inside diameter and 25cm. thick reinforced concrete walls. For the latter stages of the operation in Belgrade BVM's Kunszentmárton Factory produced a complete series of steel forms and technological equipment on which the liners were produced on the site.

Hungary has also standardized the prestressed concrete bridge girders up to a length of 32m. Their production is concentrated in three factories which together turn out 75 kms. a year on high productivity semi-automatic technological lines. The 70cm. high girders can be used to max. 25m., the 90cm. high ones to max. 27m. and the 110cm. high pieces to max. 32m. spans. In addition to highway and motorway bridges and overpasses, the bridge girders are also applicable to span over subsurface railways, underpass, underground garages and similar objects, for the construction of hydraulic engineering objects and to function as main beams in other buildings.

The large-scale production in Hungary of prestressed concrete railway sleepers started more than twenty years ago. They are much sought after abroad. Hungary has supplied railway sleepers, among others, to as faraway countries as Guinea (approximately 7,000 kms. from Hungary).

Hungary has exported several dozen complete railway sleeper facilities to Iraq, Syria, the Soviet Union and to Czechoslovakia. In fact BVM's technology developed for railway sleeper production is one of the best known, and widest applied in the world. Equally high appreciation was earned by the technology elaborated for the production of prestressed concrete power line poles. They too find ready markets abroad. □

Concrete lining used in the Budapest Metro.

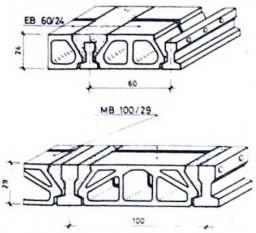
UNIVÁZ – modular coordinated multi-storey frame system

FLVÁZ – single and multi-storey frame structures.

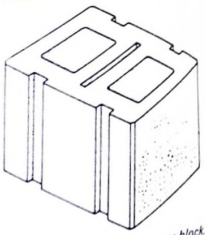
BVM

CONCRETE AND REINFORCED CONCRETE WORKS

H-1117 Budapest,
Budafoki út 209
Phone: 667-965, Telex: 22-4877
HUNGARY



Standard prestressed concrete floor beams and blocks.



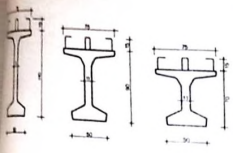
Standard hand-size masonry block

PREFABRICATION STRUCTURES TECHNOLOGIES

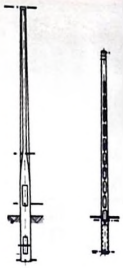
BVM

CONCRETE & REINFORCED CONCRETE WORKS

H-1117 Budapest,
Budafoki út 209
Phone: 667-965, Telex: 22-4877
HUNGARY



Standard pretensioned bridge girders.

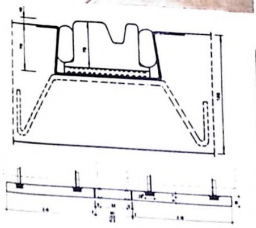


Prestressed concrete posts for lighting and power transmission lines.

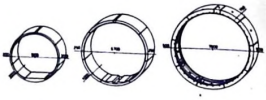
BVM

CONCRETE AND REINFORCED CONCRETE WORKS

H-1117 Budapest,
Budafoki út 209,
Phone: 667-965, Telex: 22-4877
HUNGARY



Prestressed concrete slab for tramway track construction system.



Tunnel liners for subways, railways and highways.

I would like more information on the following BVM structures or/and precasting technologies:

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H-1117 Budapest
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PREFABRICATION STRUCTURES TECHNOLOGIES

BVM

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Budafoki út 209,
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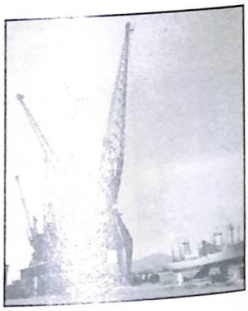
HUNGARY

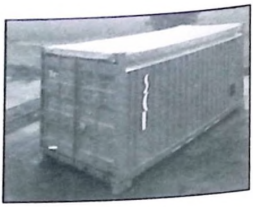
IN THE PORTS OF THE SEVEN SEAS

Floating cranes: Hoisting capacity: from 16 to 450 tons. For loading and erecting in sea and river harbours. Can also handle containers. Available in self-propelled and towed design.



Portal cranes: Modern universal-purpose portal cranes for handling cargoes in sea and river harbours. They are mobile, handy, economical and easy to operate. They can be used with a hook or grab, and some types can handle containers. Hoisting capacity: between 3 and 32 tons.

Harbour tugboats: Welded steel construction of a modern design, supplied at competitive prices. Suitable for portal operations, towing, transport, icebreaking and firefighting, even under extraordinary climatic conditions.



Containers: 20′ dry goods container of steel with front or side door or a combination of both doors. 20′ open-top steel containers. 20′ open-top steel containers, semi-high. Containers are produced according to special customer wishes. They correspond to the latest ISO specifications and are delivered under the constant control of the American Bureau of Shipping.

River Vessel: Pusher-tugs for rivers and big lakes. Barges, tanklighters, tugboats. Ferryboats, house boats, buoy-laying vessels. Special floating objects.

For detailed information and specifications please contact:

HUNGARIAN SHIPYARDS AND CRANE FACTORY

H-1904 Budapest
Tel.: 496-370
Telex: shacr h 22-5047

Meeting a worldwide need

THE Medicor Works, one of Hungary's important foreign trading and industrial enterprises, was created in 1963 by a merger of nine medical instrument factories. The company authorized to handle exports independently has importance in the domanins of research, development and manufacture.

In the company's own institute for technical development, a staff of 600 specialists are engaged in the solution of new problems, co-operating with medical institutions and with other research institutes.

The Medicor Works manufactures a wide range of medical technical implements, from hypodermic needles to X-ray apparatuses. It manufactures and exports, among others, X-ray outfits and apparatuses, blood diagnostic and sick monitoring equipment, apparatuses for the examinations of the respiratory system, operating tables, hand instruments, disposable sterile implements, etc.

Packing hypodermic needles at Medicor's factory.

Hospital equipment

The Medicor Works undertake the establishment and equipping of complete hospitals.

Among the company's products particularly great interest is shown in ionizers, which have models for respective uses in rooms, in cars and on desks. Another successful product is the portable diagnostic system. This consists of a bag containing a system of apparatuses suitable for carrying our 20 to 25 kinds of examinations. The system is thus a real mini "consulting-room", and the bag weighs 17kg. altogether.

A new product of Medicor is the panel operating theatre, which was demonstrated for the first time at last year's Budapest International Spring Fair.

Checking blood diagnostic equipment manufactured by Medicor.

The company has at present six completely specialized factories. The Factory of Electro-medical Apparatuses, the Factory of Radiographic Installations, and the Factory of Respiratory Protection Apparatuses located in the capital; the Factory of Medical Electronic Apparatuses at Miskolc, the Factory of Hospital Equipment at Makó and the Medical Instruments Factory at Debrecen.

Medicor sends its products to 60 countries and has agencies in 17 countries.

Medicor Works claim to rank among the world's top ten leading companies in this field.

Besides the traditional markets, the African countries have of late years been playing an ever greater role in the company's business activity.

Nigeria is an important and permanent market for Medicor. Here the first deal of importance was transacted a couple of years ago. Within the framework of 52 million Sfrs. worth creditline accorded by the government of the Hungarian People's Republic to the Federal Republic of Nigeria, Medicor has been delivering complete hospital equipment to several States of Nigeria. The contracts signed so far include, among others, the delivery of one 500-bed hospital and two 250-bed hospitals to Makurdi / Benue State as well as two 250-bed and seven 50-bed hospitals to Owerri / Imo State.

African demand

Medicor has a regular turnover with Guinea, where it delivers medical instruments every year. The Ivory Coast began to buy Hungarian-made medical instruments about three or four years ago and relations have been established with Mali. □

HUNGARIAN TRADE

Making profitable use of waste

AVF is the Hungarian general contracting enterprise for mineral processing and water treatment. It specialises in the design, production and installation of water and sewage purification and of mineral dressing plants.

A coal slurry treatment plant in Spain which was built by AVF Hungary.

The company started its activities when coal mining fell to a low ebb all over the world.

The core of AVF's personnel, i.e. the first team of specialists was recruited from the staff of the Tatabánya Coal Mines in Hungary.

The Board of the Mines, in 1968, viewed the problems caused by environmental pollution in our rapidly developing world and turned to manufacturing of equipment to combat it.

The aim, right from the outset, had been to produce and set up equipment for the purification and treatment of water and sewage.

Looking abroad

Having met the demand at home, AVF ventured on to the international market. In Czechoslovakia's Sturovo Paper Mill an effluent purification plant was recently completed and handed over in turnkey state. The buildings were erected by sub-contractors under the Hungarian company's supervision.

The major partners of the company enterprises in the Soviet Union, Czechoslovakia, Poland, Spain and Yugoslavia — mostly in Europe. AVF is now introducing its products to West Africa.

Under a contract concluded with the Swiss operation of the "SWISBOGAN" Company in 1977, AVF will build a plant in Togo (Kpemel for the purification of phosphate slurry within 25 months.

When the Hungarian Foreign Trade informed Tatabánya about the contract there was little time left for drawing up the designs.

Deadline met

The documentation offering an optimal solution was completed by the deadline.

Continued

HUNGARIAN TRADE

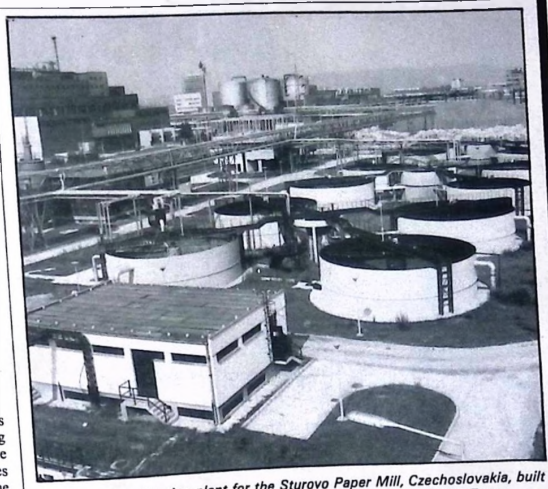
One of Togo's important mineral resources is phosphate. During the extraction of this a by-product called waste slurry arises which that country could not utilize. The problem the Hungarian contractors faced was how to turn the slurry into saleable mineral substances. This was achieved by means of separators.

No pollution

The slurry purification plant now has a two-fold task. One is production. The other is to protect the environment. Namely, phosphate slurry — so far discharged into the sea — causes serious results.

With reprocessing this waste is completely eliminated.

The work of the "Togo team" — as they are called at Tatabánya — is going on at the drafting boards, in the assembly halls and at the workbenches according to a stringent schedule. The date set for the inauguration of the plant is November 14, 1979.



An effluent purification plant for the Sturovo Paper Mill, Czechoslovakia, built by AVF, Hungary. The company is now undertaking a big project in Togo.

The KOMPLEX Hungarian Trading Company for factory equipment was established in 1953.

During the past 25 years turnover of goods increased on average by 20-25 per cent a year with activities mainly aimed at export.

Our export programme includes today the mechanization of agriculture; branches of food industry; storage and canning of fruits and vegetables; mechanisation of animal husbandry; meat processing and storage; establishment of cold stores; light-structure buildings for different purposes.

Also important areas of infrastructure, e.g. bridges, lock-gates, irrigation systems, production of prefabricated building elements, equipment of projects and prestressed reinforced concrete sleeper plants.

Exports of **our complete equipment** comprise the design, supervision and erection, consultation, as well as delivery of goods.

Considering the new requirements our company undertakes the deliveries on turn-key basis and in the case of complete projects
a "PRODUCT IN HAND" service too.

KOMPLEX HUNGARIAN TRADING COMPANY FOR FACTORY EQUIPMENT

H-1807 Budapest VI.,
Népköztársaság útja 10.
Cables: KOMPLEX-BUDAPEST
Telex: 22-5957
Telephone: 117-010

Mapping a future based on co-operation

A MODERN office block in a busy square of Budapest is the headquarters of the Cartographia Hungarian Company for Surveying and Mapping. The company's traditional intra-European relations are excellent, and as of late years, it has established business contracts with partners outside Europe, too.

We interviewed director Gyula Hegyi, mainly on these newer contacts.

Q: We have received information about the joint venture Nigerian Mapping Company. What is the Hungarian participation?

A: The Nigerian Mapping Company is a joint venture of ours together with Tesco and the Geodesic Institute on the Hungarian side. Some 60 per cent of the shares are held by the Nigerian partners, 8 per cent by Tesco, and 16 per cent by the Cartographia and the Geodesic Institute each. The Hungarian enterprises constitute one legal entity. A Hungarian director is always active on the spot.

Q: What activity is displayed by the Nigerian Mapping Company?

A: It undertakes to carry out geodesic and cartographic tasks. The activity is two-pronged: First, we carry out land surveying, and as a result we make maps for states, towns, institutions. Secondly, we elaborate maps of general use.

Hungarian specialists direct geodesic works in Nigeria and train personnel of the local population. NMC concludes many different agreements for plotting maps. Part of the preparatory work is carried out in Hungary by aerial photography until the Nigerian company acquires the skill of performing these tasks on the spot.

Q: You mentioned the company has extensive relations with other countries as well.

A: With both West European and rouble-accounting countries we have very extensive relations, broadening year by year.

We also make maps serving touristic purposes. But we readily enter into preparing educational aids (wall maps, school atlases), too. Recently we have produced an Africa-map with English inscriptions.

Tourist maps being printed in the Budapest printing works of the Cartographia Company which is involved in a joint venture with the Nigerian Mapping Company.

Q: Which work do you consider as a feat of the Cartographia?

A: Perhaps the climatic atlases made for UNESCO. Up to now, we have published two such atlases, one on Europe, another one on South America, and both of these have met international recognition. At present we are preparing an atlas on North America.

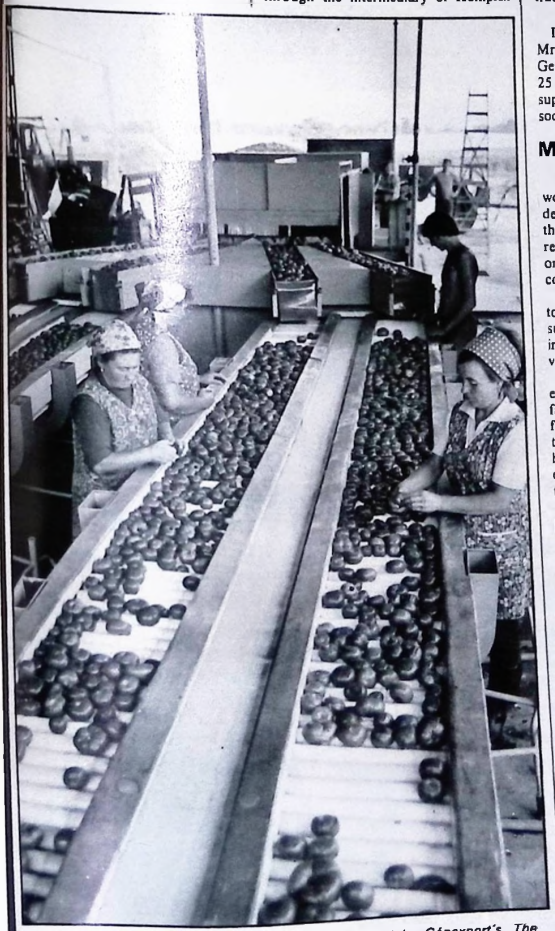
Q: Your plans for the future?

A: Though our capacity is fully utilized at present, we would be glad to establish relations with countries of the Near East and North Africa. We also take interest in the Latin American states, first of all in Central America. Co-operation deals with these states may well come into consideration.

We are ready to send Hungarian specialists on assignments, undertake evaluation of aerial photography, carry out relevant aerial triangulation, and undertake plotting maps to large scales.

Processing agricultural produce

HUNGARY has supplied complete canneries to various countries in Africa, and the Near and Mid[illegible] East. Such equipment and complete food factories are supplied by GÉPEXPORT through the intermediary of Komplex Hungarian Trading Company for Factory Equipment under general contracting agreements.



A tomato grading and packing line manufactured by Gépexport's. The company has just submitted a tender to supply 11m. US dollars worth of agricultural equipment for farm development in Nigeria.

Interviewed by *West African Review* Mr. György Csenki, Gépexport's General Manager said: "During the last 25 or so years we have regularly supplied complete food factories to the socialist and the developing countries."

Major projects

In similar major projects Gépexport works hand in hand with the Hungarian design institutes, sometimes even with the country's building industry having realized that that to remain competitive on the market, companies must provide complete services.

To step up exports Gépexport intend to win newer markets. Just recently we submitted a tender in Nigeria concerning agricultural facilities, representing a value of over 11 million US dollars.

The subject of the tender was the establishment of a complete agricultural farm and the introduction of irrigation farming. Plans foresee tomato cultivation in two cycles annually over 780 hectares, yielding — according to estimates, 22 to 27,000 tons of tomatoes a year.

Planting plan

One thousand hectares are to be planted to maize, 800 to rice and 300 to tropical fruit (270 tons mango, 170 tons of grapefruit, 300 tons of lemons and 280 tons of oranges a year). The farm is to be located in Ogon State (the town of Igbogila) in Nigeria.

In the capacity of general contractor Gépexport has also undertaken to supply shops for the servicing of agricultural machines and turnkey canneries with, for instance, tomato pureeing lines with a yearly capacity of 3,500 tons, and production equipment to process mango into jam and syrup and grapefruit into syrup.

The tender submitted by Gépexport extends also to the agricultural designs, the technology and the blueprints required for the construction of the buildings.

The complete productive equipment is to be supplied by Hungary and Hungarian experts are to supervise the fitting operations and the commission-

Continued

Complete laboratories with computer compatibility for the soil's nutritive-power husbandry

- Turn-key projection
- Training
- Measuring method
- After sales service

LABOR·MIM·HUNGARY

1450 Budapest pf. 3

HUNGARIAN TRADE

...Nigerian personnel being trained in ...ngary in the skills needed for opera... The Hungarian tender was ...vourably received in Nigeria and the ...ntract is expected to be signed before ...e end of 1978.

Gépexport has previously ...orted ...od processing machines and ...duc... ...es lines to Nigeria. The com...y, in ...ation, acts as the general c...ractor in the implementation of the ...ntract concluded by Metrimpex Jan... 1977 on the establishment of a ...hnical college in Idah (Nigeria).

The 9.6 million dollar cont... ...covers complete equipment for fo... ...epart... ments (mechanical eng...ering, metallurgy, electricity and bu...g con... struction), the teaching prog...me and even the curriculum. Gép...rt was invited recently by Niger... submit further tenders on vocatio... training schools and the supply of ...complete agricultural tractor repair st...on.

Complete plants

In Gépexport's activity sphere first place is occupied by food processing plants and complete equipment. To meet our client's requests we made adjustments on the Hungarian canneries to make them suitable for the processing of tropical fruit and designed machines to process mango, olives, artichokes and dates.

Over and above canneries Gépexport sold more than 50 high-capacity cold storage plants to Nigeria, Algeria and other countries.

In the field of meat processing, our slaughterhouses and meat complexes deserve first mention. The contracts on these facilities, which include cold storage plants of 26 tons per day capacity, were the first under which Hungary undertook not only the supply and installation of the engineering equipment but also to have the necessary buildings erected.

As regards cannery equipment, in addition to complete plants and complete production lines, we developed the so-called "split hydrostatic sterilizer". This equipment can handle cans and jars in continuous operation. Split hydrostatic sterilizers are now built in nine variants. Thirty-three are already in operation in different plants abroad, and we submitted new tenders recently to Algeria, Nigeria and India.

In recent months we submitted a number of tenders in the developing countries on agricultural and food factories, complexes and production lines — among others in Sudan and Nigeria, on high capacity canneries to process vegetables and fruit.

Export success

In the first six months of 1978 Gépexport exported machines and equipment representing a value of close on 40 million US dollars. We intend further to expand our relations and add new items to our export list. With this end in view we are going to send a market sounding mission to Nigeria, Algeria, Morocco and Tunisia.

Interest was elicited also in building projects and educational equipment or complete schools. We can record success in both fields. Several developing countries have bought our limeworks and hydrate plants.

Our educational programmes are exported through Metrimpex Hungarian Trading Company for Instruments, and Technoimpex Hungarian Machine Industries Foreign Trade company. □

AUTOCLAVES FO[R] [A]LUMINA FACTORIES

Equipment for the heavy chemical in[dustry]. In its production of machinery for th[e chem]ical industry the Engineering Works Láng keeps continuously pace with [the ra]pid development of the industry and has already achieved considerable [results] in the manufacturing of equipments of this type.

These results are well represented [by] 50 m³ and 100 m³ autoklaves for alumina factories, off our production [line].

TECHNICAL DATA:	50 m³ units	100 m³ units
Shell diameter	2500 mm.	3000 mm.
Wall thickness of shell	48 mm.	52 mm.
Nominal capacity	50 m³	100 m³
Nominal heating surface	200 m²	3250 m²
Design pressure	40/80 atm.g.	58/80 atm.g.
Design temperature	250/350°C	265/350°C
Welding quality number	Q_s =0.85	Q_s =1.0:0.9:0.8
Weight	60 t.	104 t.

Production and marketing at home by:
LANG ENGINEERING WORKS

Exported by:
CHEMOKOMPLEX
Postal address: Budapest. 62. P.O.B. 141. H-1389.
Cables: CHEMOKOMPLEX-Budapest.
Telephone: 319-587; 123-226.
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1868 LÁNG BUDAPEST

LÁNG
ENGINEERING WORKS

Budapest XIII. Váci út 152-156
Postal address: H-1393 Budapest, Pf.320
Tel: 496-550; 498-140
Telex: 022-4566

HUNGARIAN TRADE

Locomotive power

A FAMILY of low-powered diesel hydraulic locomotives have been developed by Ganz-Mávag for branch-line and light shunting services as well as for shunting in explosive areas.

The active demand for this class of locomotives has encouraged Ganz-MAVAG to develop a new family of locomotives.

The main features are: **Fields of service:** Branch-line passenger and freight services with poor track superstructures. Light shunting duty in passenger stations, industrial plants and on sidings. Shunting service in explosion risky environments, marshalling and freight service.

Driver's cab: Centrally placed cab located possibly at a suitable height to give good all-round visibility and comfortable drive.

Axle load: 10 to 12 tons because of the branch lines with poor track superstructure.

Running order weight: Approx. 35 tons are required to perform the specified hauling capacities.

Axle arrangement: The above conditions involve a three-axle arrangement.

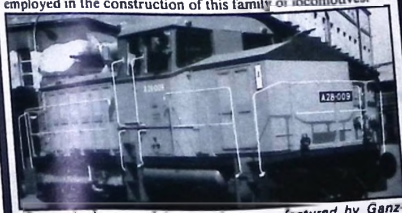
Type and output of engine: Hauling conditions require an output of 400 to 500 HP, therefore the choice fell on the Ganz-MAVAG 8 V engine, the naturally-aspirated version of which develops 400 HP while the turbo-charged version develops 500 HP, both engines being characterized by their compact design. Over a thousand of the 12 and 16-cylinder versions of this family of engines are now operating in Diesel trains, rail-cars and locomotives.

Power transmission: Because of the small locomotive weight only hydraulic transmission could have been taken into consideration which, in view of the shunting service, is provided with a pair of torque converters separately for both the forward and reverse running, developed by the factory itself. In the transmission unit, the shunting and line stages are engaged by mechanical change gear.

Type versions: In making the design work our principal aim was to ensure the possibility for the development of as many versions as possible from the basic type, since any order covering a small quantity of locomotives can be fulfilled economically in a short delivery time only this way.

The main features of the alternatives taken into consideration were as follows: Track gauge optional between 1000 and 1676 mm.; tropical and cold-climate versions; locomotives equipped with alternator, for light branch-line passenger service, for hauling 2 to 4 electrically heated cars; explosion-proof shunting locomotives for operation in the oil and chemical industries; bogie-type locomotives from 750 to 1067 mm. gauge with an axle load of 8 to 10 tons.

Modular construction: In order to be able to start on the manufacture in a short time and with the least drafting and manufacturing preparatory works, the modular principle was employed in the construction of this family of locomotives.



An explosion-proof locomotive manufactured by Ganz-Mávag.

COPING WITH NATIONALISATION

FROM a modest beginning in 1959, Nigerian Television has now become a complex network of 19 stations, with television now accounting for a sizeable part of the national budget. When in May last year the Nigerian Government set up a new Television Authority for the country, the choice of Director-General went naturally to Vincent Maduka. At 42, he is perhaps one of the most articulate and pragmatic Africans in the television business. Under his tenure as Chief Executive, Nigeria's WNTV Ibadan (first in Africa) became a show-piece in programming and commercial viability. That was before WNTV — like all other TV stations in Nigeria — was taken over by Nigeria's Federal Military Government. In a recent interview, Vincent Maduka talked about Government control of television and the role of television in the Nigerian society.

CHIAHEMEN: What has been the rationale for the take-over of television stations by the Federal Government from the states which were formerly operating most of the TV stations in the Country?

MADUKA: One of the reasons given by the Federal Government was to limit the element of independent growth of the television industry at the state level and if possible, to prevent the setting up of more independent stations by states that didn't have them already. Of course television is a most expensive business, from the point of view of capital, talent, and the manpower that will run it. So when you realise that Nigeria could well be operating something like 19 completely independent television stations that are not freely competing with one another in the same coverage areas, but all localised, then you can appreciate the effort and the cost of maintaining such a system in a country in which none of the equipment or the materials used are manufactured. So largely it's from a point of view of economy that this (takeover) came about. Of course there are the other aspects of marshalling the forces of television to promote national unity which can be better done by some degree of centralisation.

Q: In this regard there have been arguments from many people, not just in Nigeria, that, in a society like Nigeria where the people are predominantly poor and illiterate, the huge sums of money spent on television are not justifiable. That there could be other better and cheaper means of communication, like radio and newspapers. Would you say that the Nigerian experience in television so far has vindicated these expenditures?

A: It's largely a subjective matter. It's also perhaps comparative. Because if you take the money spent on TV in Nigeria and compare it with the population you will probably come to the conclusion that so much money spent on radio would have perhaps given better coverage and greater effect from the point of view of numbers reached. I think that would be true. But in the first place radio is a fairly well-developed medium in the country both at the state and the national level. Then television has its own qualities and its distinctive characteristics which radio can never achieve whatever sum of money you put into radio. To the extent that television is still a minority consumption item doubts may well be expressed as to the relative effectiveness of television and radio, given the amount of money involved.

Q: So what can practically be done to increase the impact of television?

A: There are two major areas of television reception in the country. One is by the individual ownership of television sets and the other is by community viewing. On the private ownership side, what you can do from the television end is to see whether you can in fact promote the importation or the assembly locally of relatively inexpensive TV sets. But the most inexpensive set is still quite expensive judged by the average earning capacity of the society. Of course as the economy develops and the buying power of the individual increases — which is happening very fast in Nigeria — one expects that the ownership of television sets will also increase. It may be faster than the economic growth because of the special desire of people to own sets and gain access to the programmes. On the other hand the growth of community viewing sets can be largely and quickly expanded. If we were to allocate like ten per cent of the resources we now set aside for making programmes and broadcasting them to promoting community reception, I believe we'll have such a tremendous growth in the number of people who could have access to TV sets. This is a matter that the Authority itself has come to recognise and is doing everything to promote.

Q: So what is the relationship between the Authority and the various television stations in the country?

A: The Authority owns and regulates all the stations in the country. It also funds them. The Authority itself is quite new and the relationship is still being developed. But statutorily what I have just said is correct. But of course in a creative field and in a vast country like Nigeria over centralisation would not be the answer to the questions which were posed before the take-over of television stations by the Authority. Therefore a very high degree of decentralisation is envisaged. First of all the 19 states are being grouped into six zones which are headed by Managing Directors. The Authority is headed by a Director-General. The various stations can also raise money through commercial activities like advertising.

Q: The Independent Broadcasting Authority (IBA) in Britain provides facilities like transmitting stations and carry out research into new technical possibilities in Broadcasting. Do you envisage such a role for the Nigerian Television Authority?

A: Of course our roles are in many ways similar to those of the Independent Broadcasting Authority in Britain. Except that while they regulate independent organisations, we regulate organisations which we own ourselves. But functions like technical research are already in our plans. But technology in this part of the world being in its infancy means that research into solving the problems that are immediate and peculiar to us will obviously attract most of our attention. But research is very expensive in terms of manpower funds, patience and tenacity. These are things we don't have in abundance around here.

Q: So now that Nigeria is planning to return to civilian rule next year how do you hope to maintain the neutrality of television in partisan politics?

A: Well I think its' going to be difficult. It's difficult everywhere in the world and it's not going to be any less difficult in this

Continued

...ry. In a partisan civilian set-up there ...very many power interests to cater for. ...now there aren't such strong power ...rests other than government, and ...nment itself is one that has made its ...ouncements on the liberty of the ...vidual. Its main mission is corrective ...therefore by and large what the ...ians did wrong like clamping down on ...media — the military administration ...tended to undo and has generally ...wn more liberalism. It's difficult to ...cipate but one would like to th...k that ...media in the country gener... have ...blished a certain strength and ...uence ...an awareness among the pu... and it ...ld take some time, I'd like to ...nk, for ...type of government to come ...ng and ...blish that.

Q: Nigerian TV now has been ...y well-established since 1959 — whic... a good ...ord — considering that mos... ...ions in ...Britain were not in existenc... the time — why has it been so difficu... develop ...igenous programmes for tele...on?

A: We have to examine the fo...ations in ...society on which televisio... has come ...g. The British for instance, ...ve a very ...g tradition of literary genius and a great success in drama in literary works and the performing arts. In the United States too, they had a very long and well established tradition of entertainment: Vaudeville, Broadway, big money entertainment generally. There was the cinema. Hollywood was very well established before television came along. Therefore television came and sat on a very strong foundation, very well developed, and based completely on full-time professional artists and producers. This of course, is what we don't have in Nigeria. We don't have such a well developed stage, a well developed tradition of literary works. The literary or creative works in the country have been largely plastic and oral and televisions as we were taught, is not such a great exploiter of these two forms of art. But really the question is perhaps we should have tried to develop television based on what we had going instead of trying to develop television on what we saw going in other parts of the world. Not surprisingly we have not come a long way in using television to achieve those ends. Now the question arises whether we should stop where we are now and take another look at what we should be doing with television rather than trying to do what others have done successfully with television . . . I think this is our first task in the Nigerian Television Authority.

Q: But there is another area of television in which Nigeria could certainly do better. For instance, in view of Nigeria's importance in African affairs and the International political system, one wonders why, for example, there was no single Nigerian television news team on such an important occasion as Egyptian President Anwar Sadat's visit to Israel. Indeed no Nigeria television crew has reported from such areas of importance to Africa as South Africa, Rhodesia or more recently, the war in the Ogaden. Why is this so?

A: I think all this is based on the size of an operation. Television is still largely an elitist business whatever we may say. So in fact when you talk of the Ogaden and the events in Southern Africa you too are thinking straightaway of the elitist minority in Nigeria who have great interest in events in Southern Africa, in Israel and the Ogaden. Now really it's for television to decide whether given their very limited resources they should devote very large proportions (because that's what it would amount to) of these in covering these external events, whereas you have right at home very pressing issues which are very close to the lives and to the happiness of the public. We think that while television remains this window on the wide world it should really start by coherently examining and improving the lives of the people at home. This is our primary area of priority insofar as the allocation of resources go.

Q: But then within Nigeria itself wouldn't it appear that in the past television stations have devoted most of their informative programmes to publicising the activities of government to the people rather than the other way round?

A: Yes I think there is a lot for me to agree with that. But of course the criticism itself may not necessarily be related to the realities of our own society. The activities of government are paramount in this part of the world. We don't have the same big time business, big time sport, big pressure groups, religious groups which may well take up a good deal of the nation's time. In this part of the world, most of the issues are government-promoted, they are government-activated and whatever way we look at it government makes most of the news in this part of the world. However, if communities are making news they must be given the same amount of time as any other group that makes the news. It may well be that if we look hard enough we may find a lot of other competing news stories but I doubt it because this is a matter that one has addressed his mind to. People are worried about wells, about irrigation, about disease, about just anything like this and you'll find it's within the domain of government and largely treated by government.

Q: Is it possible to estimate what is the percentage of foreign programmes shown on Nigerian Television now?

A: It is difficult to say taking the NTV as a whole. All the older stations that is those which have been on the air for five years or more have something like 80 per cent local programmes air-time wise. If you were to count the number of programmes the ratio would be even more than that.

Q: How do you go about monitoring and evaluating audience appreciation of television programmes?

A: At the moment it is not done on a very large scale or in any formal way. One or two stations do have viable audience research units but this is not universal yet. However, during the coming year all main audience research is being taken over by the Central authority as one of its machineries for monitoring, evaluating and auditing the performance of the stations and the general acceptability.

Q: Will that involve an intermediary agency like the JICTAR in the UK?

A: No. If you take the JICTAR in Britain, it is an organisation to which all independent television stations subscribe. On the other hand in the Nigerian situation, all the television stations are not independent. But because this body is also within the NTA you might say it is jointly owned by TV stations and yet doesn't belong to any one of them.

Q: Do you have any problem in attracting qualified people into TV and what are the prospects for local training?

A: We don't attract as many qualified Nigerians into TV as we would like. Television is old in the country but it has not always been seen as an intellectual and as a highly professionalised activity. The general belief that it is one for people who have a flair rather than a skill and intellect, I think, may have tended to keep back people who could have come in and become masters in either the arts or the skills. So on the whole it has attracted only the people who were lured by the glamour in television. It's only in the last few years that the industry itself has really begun to examine its business as a productive one in which management methods should equally be applied and the whole question of manpower as a most vital resource has only just begun to be tackled. The training requirements need to be just as enormous to be able to cope with the problem. These we are tackling on the short-term basis by running several in-house courses. We are bringing in whole facilities from abroad in the coming months to begin to run courses in Nigeria. We reckon that we might make savings from the large number of staff going aboard as well as the advantage of training in their own enviroments. But in the long run we hope to have a school that will train people and award diplomas and make staff recognised practitioners.

Q: In the industrialised countries they are now having problems with the bad effects of television in the form of TV violence and sex and their effects on young viewers. How do you hope to cope with this type of trend in Nigeria?

A: We are studying the research reports on these social effects of television. Even where they are said to be inconclusive, once there are sufficient doubts to warrant caution we would take such caution. A lot of imported material — particularly those with a lot of violence and sex, are sometimes completely unrelated to the realities in our midst. Some of the crime films for instance, the methods of tracking down the criminal, the amount of shooting and all the violence that one sees is completely unrealted to what goes on in the society. And for the behavioural scientists it may be a very interesting subject. The fact that it is unrelated to what goes on in the society. nobody even takes much notice of it — that you just laugh and take it as one huge joke, possibly. On the other hand it may be a way of importing what is completely alien to the society. One doesn't really know what the psychologists will say about this. □

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Problems of development

NTV Jos was the first colour television station in Nigeria. This article, based on an interview between Tom Adaba, Director of Programmes in Jos, and John Chaihemen from TV World, looks at the problems they have been faced with and how they have been overcome.

On October 1, 1975, Nigeria Television (NTV) Jos, became the first colour television station in Nigeria — 15 months after the establishment of television in the country. Since then the station has maintained a comparatively efficient standard of engineering and production. In several ways, however, it typifies all the problems of television, not just in Nigeria, but in other similar developing countries around the world.

Initially established by a state government, NTV Jos, like the other 18 stations in Nigeria, is now completely owned and regulated by the Federal Military Government of Nigeria through a body — the Nigerian Television Authority (NTA).

Centrally-located in Jos, capital of Nigeria's Plateau State, the station transmits in VHF, with an average broadcast time of 6½ hours a day. According to the station's own official statistics, it started production in 1974 with a programme mix of 64 per cent local production (time-wise) and 36 per cent of foreign programmes. Last year, local programmes rose to 67.4 per cent only.

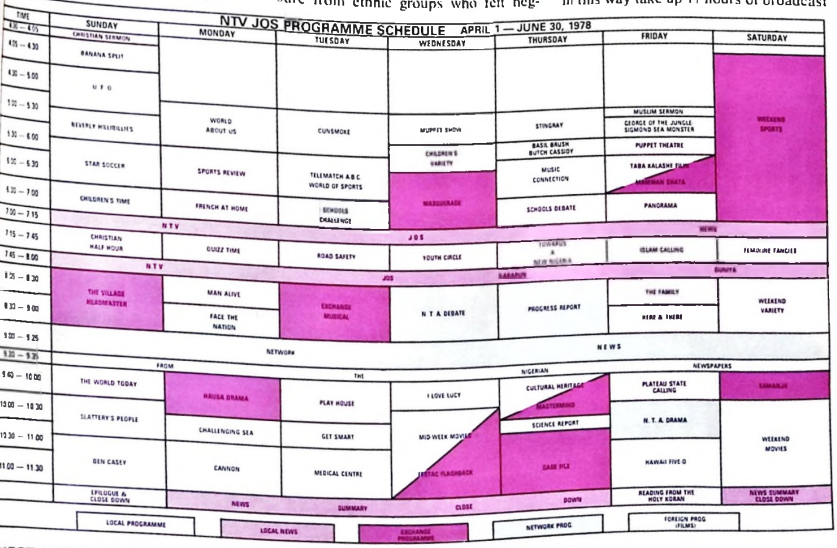
Indeed the task of increasing local production and phasing out foreign programmes has been the major preoccupation of Tom Adaba, who, at 36, has been associated with NTV Jos since its inception. A Mass Communication graduate of the Ohio University, Tom Adaba is now the Director of Programmes in Jos. According to him the station has approached this problem in a number of ways, some of which have proved counter-productive and have since been abandoned.

He explains: "When we started production, we introduced magazine programmes in the seven major languages in our coverage area. The magazines, of 30 minutes duration each day, comprised news highlights of the week, music and dance as well as discussions of public issues of interest to the local people. To ensure we were being watched we distributed some 32 TV sets to the Local Authorities and where necessary provided power generating plants for public TV viewing. One year later we gave up the magazine programmes due to pressure from ethnic groups who felt neglected because their own languages were not selected for the programmes. We couldn't have programmes for each of the 50 or so linguistic groups so we gave up the idea altogether."

Now the programme planners are trying to get round the problem through the use of drama both English and Hausa (the dominant Nigerian language).

As Adaba explains further: "We believe that drama can bring out more of the ethnic culture on a much broader basis. Drama is also a mirror of society and could serve to highlight views and correct ills in a society. We have increased our drama programmes from one English drama a week to three. The last addition **"The Family"** has received such acclaim that we are hoping we might have two episodes a week. Similarly we've added one more Hausa drama and the reception is equally good."

Another approach being used to increase local programming is through programme exchange on a bilateral level among the various stations in the country. Programmes received from other stations in this way take up 11 hours of broadcast



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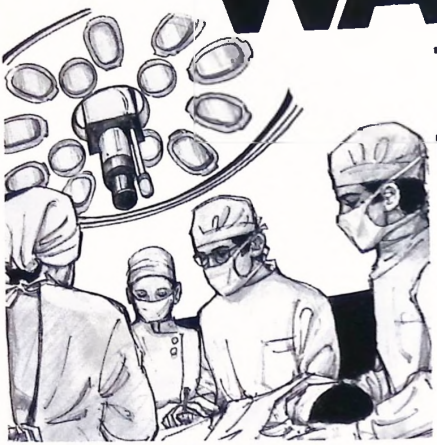

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...ch week on NTV Jos. So far, the ... in exchanged programmes is ...rds drama and music.

...ddition to the 11 hours taken up by ...changed programmes each week, the ...ork Service of Nigerian Television ...ges local stations to hook to its daily ...missions which amount to ...bout ...hours a week. This includes ... all-...portant daily Network news at 9.30 ...

...This means that out of a week's ...road-...ast of 45½ hours on NTV ... the ...ange programme material ... Net-...k programmes take up a to... of 20 ... – nearly half the total ...eekly ...dcast time. NTV Jos is thus ... with ...hours a week, 26 per cent ... which is ...ken up by foreign programme...

Despite the desire of many N... ...ans to ...programming extensively, ...ligeni-...el, television executives at N... Jos be-...ve it is neither to the inter... of the ...ience nor the station to completely ex-...ude foreign programmes on the sche-...le. Given the low production budgets at ...which the stations operate it is good ...conomics to buy programmes from ...abroad. As Adaba sees it, foreign pro-...grammes enrich the overall programming ...by the station. He says: "I will never ...subscribe to the idea of eliminating fore-...gn programmes completely. Some prog-...rammes have universal appeal and could ...be bought for Nigerian audiences. Others ...have a regional appeal and should be ...shared out where they have no relevance ...to our society. My own preference is for ...documentaries and police detective films. ...Good police films can educate our own ...police too. But even here I am screening ...thoroughly and not just taking everything ...on offer."

Foreign programmes on NTV Jos are ...mostly the conventional thrillers from ...Britain and the United States. The ...Nigerian TV audience is still to adapt to ...the habit of watching subtitled films in ...French, German or Italian. Series like the **"Wild Wild West"**, **"The Saint"**, **"Hawaii Five-O"** and **"Invaders"** are among the foreign TV series that have made strong impressions on the audience and have become household names among TV viewers in the coverage area of NTV Jos.

Of concern to executives at NTV Jos too is the lack of a machinery for monitoring the popularity of programmes and audience appreciation of them. There are no ratings and hardly any internal research units in Nigeria. Programme executives have to make do with whatever comments viewers make in the newspapers once in a while and a few who bother to write to the station directly about the programmes. But as Adaba complains, this is not enough. "We don't even know the number of households with TV sets in our coverage area. We tend to programme for the elites because they are the people who complain when they don't like particular programmes. So we have to programme what they'll like."

Hopefully this problem will be solved from the centre when the Nigerian Television Authority sets up an effective research unit as it hopes to do shortly. Ratings will however be an insignificant factor on Nigerian TV as there is no competition — all stations operate within their local areas only.

An area in which NTV Jos has made an obvious mark is in engineering. Not only

Tom Adaba

was it the first station to go colour in the country but its picture quality and engineering continuity has remained the highest in the country. NTV Jos officials put the cost of the station — including the administrative block — at four million dollars. The production wing comprises one continuity studio and a larger one for drama and talk shows. The dependence on only one large studio is hampering the growth of local production.

The two studios between them have five Ampex BC2303 cameras while the only outside broadcast van has four Ampex BBC 1 cameras. There are four Ampex VTRs of the 1200 series and two Marconi colour telecines. Four PYE monochrome telecines installed at the inception of the station are still used occasionally. NEC supplied and installed two 10 kilowatt transmitters — one of them a standby.

The station started off with an ambitious programme to establish a well-equipped film and ammation unit which would service the Nigerian film industry and the advertising industry. Now, even officials admit that lack of skilled manpower alone has hampered the realisation of this goal.

Today, Jos like other stations in the country, uses electronic news gathering equipment extensively and is equipped with NEC MNC 62 colour cameras and Sony U-matic playback VRCs. With a staff strength approaching 500, among them, several graduate producers and directors, the station is one of the best staffed in Nigeria. In fact officials believe the station is fast approaching a situation of excess executive capacity at the expense of skilled middle-level technicians who are the hallmark of quality TV production.

This is a problem that has been identified by the NTA as common to most Nigerian stations and to which the Authority is seeking an immediate and long-term solution through the intensification of a nationally co-ordinated training programme within Nigeria.

Government financing and control of NTV Jos has not resulted in overt censorship or undue interference in programmes. What it has done is encourage complacency and discourage motivation and the type of drive that one gets in a commercially oriented TV station. It hasn't helped matters that some key officials were coopted from the civil service at the inception of the station.

Another thing that NTV Jos failed to do right from the beginning was to change the whole style of TV programming and presentation. In other words it failed to bring in originality in programme type and packaging — given the modern equipment the station started with. Instead it toed the lines of older NTV Kaduna — a nearby station which had done the groundwork for the establishment of NTV Jos and from where most of the new station's staff were recruited in the first instance. There was almost a total transplantation of the programming, packaging and presentation of Kaduna and many programmes differed only in name. In fairness to Jos this seems to be common to most of the new stations which had a helping hand from older ones at the time of their establishment.

Nevertheless NTV Jos has maintained a good national reputation and her productions on the network service are popular. What is difficult to say is whether a station like NTV Jos will be able to break even financially if and when Nigeria decides that TV stations, which have survived on public money, should pay for themselves. □

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West African TEXTILES

FOR THE TEXTILE INDUSTRY OF WEST AFRICA

West Africa's raw cotton market

In the following report John Garner of Liverpool Cotton Services outlines the current trends in West Africa's raw cotton market and the probable yields for this year.

For several of the central and West African countries, the export of raw cotton is the principal contribution to foreign exchange earnings. Production of the commodity is a precarious occupation, since yields are in most areas critically dependent upon the very capricious rainfall. All too often, the increasing rains early in the year permit the establishment of an acreage that is woefully unproductive owing to the disappointing precipitation during the period of principal plant growth.

In very general terms, the production of cotton has proved relatively most successful during recent years in those countries who have maintained a relationship with France. The impetus throughout the West African region has been on the decline and Zaire for example has recently been obliged to import cotton in order to meet her minimum domestic requiements.

In Nigeria too, early promise has not been wholly fulfilled. As in Zaire, the type of lint grown is of a kind particularly acceptable to the spinning industries of the world, being of an exceptionally uniform of "even-running" quality. During the fifties and early sixties, production was fairly consistent at around 50,000 tonnes, and a flourishing domestic textile industry was developed. Exports were, for a time, maintained thanks to an increase of production, but cotton farmers later appeared to receive relatively little support, and by the mid-seventies exports had shrunk to negligible proportions. Quite energetic efforts are now being made to restore the situation. Nigeria probably produced about 40,000 tonnes of lint in the 1977/78 season. The rains have been very satisfactory so far this year, suggesting that am much larger crop, perhaps of 54,000 will be forthcoming in the current season.

In the "Franc zone" countries, Chad, who exports virtually her entire crop, has for many years been the leading producer. The recent political difficulties and marginal nature of much of her agriculture have tended to restrict increase of late, and she is now being challenged for the leading position by both Mali and the Ivory Coast. the pace of progress has been particularly impressive in the latter country, whose domestic textile industry is also growing apace. While the French cotton agricultural research organisation is in part responsible for the improvements, credit must go too to the domestic institutes, who have provided admirable encouragement to the growers. It is still too early to essay with any confidence an estimate of the total "Franc zone" crops, but current indications point to a production in the region of 225,000 tonnes, with Chad providing nearly 60,000, Mali 46,000, the Ivory Coast 44,000 and Cameroon 23,000.

Africa shows optimistic returns for textiles

STATISTICS ARE notoriously difficult to assemble and to assemble them quickly in terms of any world activity is virtually impossible . For this reason it is not so surprising that textile business figures for world activity are, as yet, confined only as far as 1976, but even at that date it was obvious that the world slump was having a serious influence on world textiles.

However the developing countries of Africa showed much more optimistic returns than came from the industrialised countries of Europe, America etc.

World data from IFCATI in Zurich can be summed up as follows:

Spindles installed — '000 — 1976

Europe	47,925 (45,460)
N. America	21,950 (20,639)
S. America	8,363 (7,758)
Asia and Oceania	66,355 (58,067)
Africa	4,933 (4,747)
World	149,506 (136,671)

The figures shown in parenthesis are the figures for spindle actually actively spinning. But what is particularly interesting is the figure for the average hours worked per spindle throughout the world. The world average was 5,966, but throughout Africa it was higher than anywhere else except Asia, standing at 6,469, while in North America it was only 5,947 and in Europe — a clear reflection of an over capacity — it was a mere 4,834 and this was out of a maximum possible running of 8,760 hours = 24 hours per day, 7 days per week for 52 weeks per year.

The reason for Asia having a slightly

(Photo courtesy of Compix)

West African TEXTILES

FOR THE TEXTILE INDUSTRY OF WEST AFRICA

...ure figure (6,646 hours) is not difficult ...derstand when one takes into con-...ation the immense populations in the ... and the pressing demand for textiles ...ctually all manufactured products.

The figures for 1976 for the numbers of ...ms installed and active can be tabulated ...llows:

...ooms installed in 19...

...rope	822,503 (...53)
...America	375,221 (...519)
...ia and Oceania	218,245 (...500)
...frica	1,444,235 (...25,909)
...World	99,490 (...446)
	2,959,694 (...9,927)

...Looms running are shown in parenthe-...

Once again Europe comes at the bottom of the list when it comes to the average number of hours worked, as a mere 4,424 compared with a world total of 5,625 hours.

Here it is North America where the maximum utilisation is to be noted at 6,136, followed by Asia at 6,004, while Africa comes third at 5,947 and fourth South America at 5,345 — again below world average levels, so that it would again suggest that in world trends there is an over capacity not only in Europe but in South America and it is not unreasonable to assume that as manufacturing capacity increases in the developing and cotton-growing countries such as those in Equatorial Africa this imbalance will increasingly be felt.

In figures for the period 1966-1976 the spindle hours worked in Africa have been consistently higher than anywhere else in the world with the only exception being in 1973 when South America pushed the figures into second place and in 1976 when Asia marginally dislodged it again to second place.

Loom hours worked in the same period of 1966-1976 again sees Africa in the lead over almost all the period and consistently operating within what is identified as 3 shift working. In 1966 and 1967 the North Americans saw a pronounced fall and by 1968 were below the 3 shift norm which has never since been passed, while it was only in 1975 that African loom hours worked slipped below the 3 shift norm and were overtaken by the North Americans and Asians, but clearly this is likely only to be a temporary lapse. Only European capacity wavers between single and double shift working in this period.

Some figures showing cotton-type spinning capacity in various African countries are included in the statistics and these also reveal that rotor spinning is on the increase while ring spinning in certain places is in decline.

The numbers of three and four cylinder cotton-system spinning spindle and open-end rotors at 31 December can be given as follows:

	1975		1976	
	Spindles ('000)	Rotors (units)	Spindles ('000)	Rotors (units)
Algeria	190	n.a.	200	n.a.
Angola	38	n.a.	38	n.a.
Egypt	2,110	800	1,288	2,400
Ethiopia	165	n.a.	157	n.a.
Ghana	74	n.a.	75	n.a.
Cote D'Ivoire	57	n.a.	37	n.a.
Kenya	57	n.a.	64	n.a.
Madagascar	85	800	73	800
Morocco	300	5,500	215	9,656
Mozambique	30	n.a.	40	n.a.
Nigeria	425	n.a.	450	n.a.
Sudan	100	n.a.	136	n.a.
Tanzania	98	n.a.	107	n.a.
Tunisia	77	n.a.	77	n.a.
Uganda	96	n.a.	96	n.a.
Zaire	100	n.a.	103	n.a.
TOTALS	4,800	n.a.	4,933	n.a.

n.a. = not available.

The Angolan figures are the same as no data were provided to show any change. The figures for Sudan are for the public sector only, while the figures for Algeria, Ethiopia, Ghana, Nigeria and Zaire have had to be estimated which means that the subsequent total is a calculated estimate. In the total are estimates for spindles in countries not listed, but which can be given as follows:

Malawi	40,000 spindles
Senegal	40,000 spindles
Somalia	20,000 spindles
Zambia	20,000 spindles

It is generally assumed that one rotor spinning unit is equivalent to 2.6 ring spindles and on this basis it means that the ring equivalent of the figures given in the above table which total 15,170 rotors is really equivalent to 39,442 ring spindles would bring the capacity of Africa in 1976 to a ring equivalent of 4,972,442 spindles.

Figures have been released about estimated number of hours worked by spindles and rotors in the various countries, but the inevitable 'n.a.' really makes most of these meaningless — certainly as far as rotors are concerned, although in 1976 the number of hours varied widely from as little as 3,840 hours in Algeria up to 8,400 hours in Tanzania, while in Nigeria, the utilisation of equipment was shown to be some 6,300 hours and in Ghana it was up to 8,280 hours.

From the figures for ring spinning capacities it would appear that in 1976 the production capacity in Africa was just about double that of the United Kingdom and somewhat more than Brazil, but still well below the capacities of say West Germany, USSR., USA. etc, and about 10% the capacity of the combined industries in East and West Europe. All this suggests there is still plenty of scope for growth in almost all the countries of Africa. □

Some of the ornate hand-woven and hand-painted wall coverings to be found in the North of the Ivory Coast.

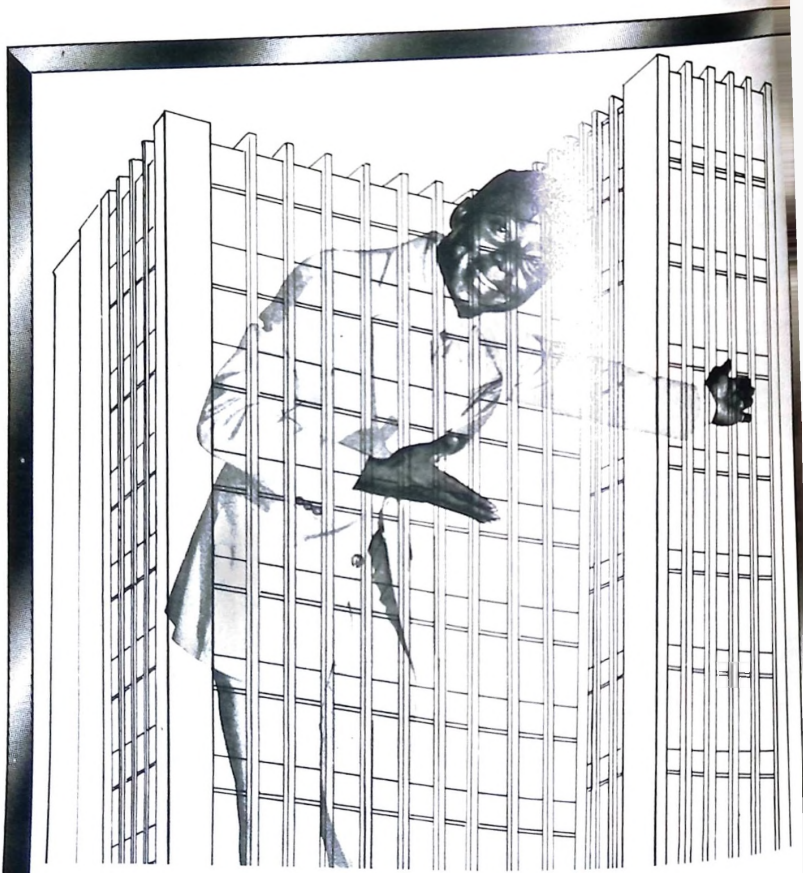
Cotton Production in Nigeria 1969 – 1978 (In Bales of Lint of 180 kgs.)

Season	Total Bales of 180 kgs
1968–69	313,229
1969–70	504,986
1970–71	217,619
1971–72	211,612
1972–73	267,066
1973–74	170,720
1974–75	281,985
1975–76	322,038
1976–77	443,195
1977–78	216,000*

* Estimated — Ginning still in progress

COTTON PRODUCTION IN FRENCH WEST AFRICA

1,000 tonnes cotton grain	1961-2	1968-9	1969-70	1970-1	1971-2	1972-3	1973-4	1974-5	1975-6	1976-7	1977-8
	27	103	164	168	228	235	226	243	290	309	283[1]



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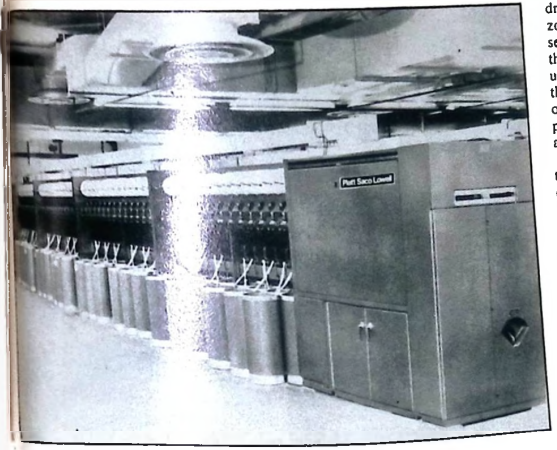
OPEN END SPINNING



Platt Saco Lowell Rotospin Type 885 rotor spinning machine.

Open-end spinning is particularly fabourable in West Africa as it can handle all types of cotton and upgrade the yarn made from it. This article looks at some of the rotor spinning machines on the market, their advantages and applications.

MUCH OF the cotton grown in West Africa is Acala which was originally developed from American seed and is particularly disease-resistant. By far the biggest cotton growing country is Nigeria and in addition to growing Acala a certain quantity of Coker is being planted. What all this means is that much of what is produced has a stapled length of 26.99 mm and 26.19 mm staple length but here is also cotton being harvested which can be as low as 24,61 mm staple and this does not really lend itself to the production of particularly high quality yarns.

Albar cotton is another variety started in Nigeria and has been developed in East Africa, but both Acala and Coker originated in the United States, having been developed from the original Allen variety. The cottons are good, but can be very much affected by seasonal weather conditions which can influence the length of staple.

It is here that open-end spinning has special appeal for it is a process that is particularly suited to handling the lower grades of cotton and of upgrading the yarns made from it.

In the United States there is a type of cotton that is grown in West Texas and it has a problem of being what the American spinners feel is too short a staple. This has impeded acceptance of what otherwise is reckoned to be a pretty good cotton. But spinners have felt that it really offers serious drawbacks when it comes to spinnability. As a result some 3,000 cotton growers have come together and erected a mill which is intended to demonstrate that this type of cotton can be used and is able to be converted into high quality denim.

What the American Cotton Growers have done is built an open-end spinning plant based on the standard equipment of the Swiss machine builder Maschinenfabrik Rieter and today the plant is in full production making good quality denim.

Open-end spinning a recent commercial development

Open-end spinning is a fairly recent commercial development that is fast coming to replace ring spinning in the medium to coarse count range of cotton-type yarns. It has several advantages and while it is only about 20 years old in commercial terms, it is a concept that has been known for roughly a century.

Traditionally cotton has been spun on the ring spinning frame and here the sliver of cotton is fed through various types of drafting system, typical of which is the two-zone, double-apron type. Each unit in the sequence operates at a higher speed than that preceding and so attenuates the sliver until it can be dropped down to pass through a traveller revolving at high speed on a ring. This encompasses the yarn package which also revolves at high speed and on which the twisted yarn is wound.

Clearly there are certain limitations to this system. The size of yarn package is confined to a certain diameter for any increase will force the traveller speed to be reduced and an increase in package weight will also limit the speed of actual package rotation.

With open-end spinning a totally new concept is used and the very expression 'open-end' suggests that there is a sequence in spinning where the fibres are free and fully opened and not under any direct physical control.

West African TEXTILES

On most machines which are rotor spinning machines, a beater roller — or opener — is fed with a drafted sliver and this roller pulls individual tufts of fibre from the sliver and drops them into an air stream. This air stream carries them into the centre of a rotor that operates at very high speeds and which acts as a sort of mini-centrifuge. Here the fibres are whirled against the walls of the rotor and yarn is gradually and continuously formed and pulled away either down the centre of a hollow spindle that carries the rotor or upwards and through the centre opening of the rotor. Both systems are used. The fibres, as they are stripped away from the rotor walls are twisted into a yarn and hence the expression 'open-end' as there is no positive link now between sliver and yarn-formation in the rotor. In the early stages of development this process was also described as 'break spinning' but this is a term now seldom used in the trade.

In the relatively short time since it was first commercialised by the Czechoslovakians, rotor spinning has come to be seen in very clear terms. It does not, for example, offer much advantage to spinners who wish to spin finer than 30s c.c., while it can be used to upgrade yarn qualities it should not be seen as a simple substitute for ring spinning: it is not. It allows very large packages of yarn to be produced and these can often be used without any of the clearing that one normally needed with ring spun yarns. This is because OE yarns are more consistent than ring spun, but against this must be set the

Continued

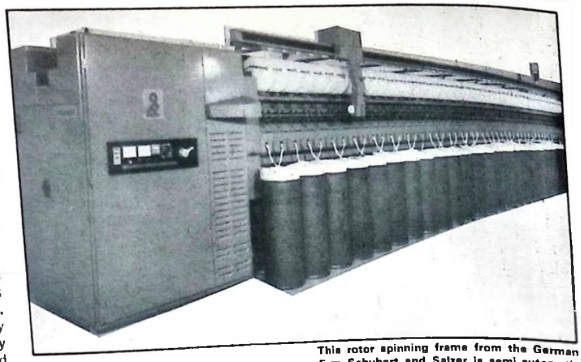
...al OE yarns are 20-25% weaker ... ring spun, count for count, and even ... in certain circumstances, but again ... is the feature that they tend to be ... abrasion resistant, so here one is ... with what can be lost on the ... go round is gained on the proverbial ...

The first machines that were built for ... cotton-type fibres were confined ... fairly slow speeds and these are still ... probably the most widely used frames in ... trade. Speeds of 25,000 to ... and ... rpm are characteristic of ... first ... machines. Now the ... is ... about the second generati... speeds ... 60,000, 90,000 and even 100... rpm, ... there is a question of y... quality ... the problem of making go... quality ... at these speeds is a serio... and ... such machines ... high ... of sophisticated automa... which ... not only very expensive but ... ch also ... a high level of maintenan...

West African TEXTILES

If one considers that perhaps what is really needed is mechanisation rather than automation, the slower speed, simpler machines of the first generation have much to offer. Rieter of Switzerland has pointed to the fact that in one mill in Germany where 40 of their frames are running, the self-cleaning rotors that could well be troubled with the dust from cotton, need only be cleaned once a week and for this a special team is brought into work its way through all the frames each week. This mill takes particular care of its cotton preparation, making sure that not only all the trash is extracted from the raw material before it is blended as sliver, but that the dreaded micro-dust which can cause health hazards in the mill and which will collect in rotors to give uneven yarn and low machine efficiencies, is extracted at the point where it is released from the dense mass of fibres. The result of all this is a mill where no dust or loose fibres float in the atmosphere.

Platt Saco Lowell Rotospin type 883 rotor spinning machine (wide gauge version).



This rotor spinning frame from the German firm Schubert and Salzer is semi-automatic with an overhead travelling unit that will follow the operative to a stopped position and which is then manually operated by the operative to start up the spindle.

Rotor spinning is a development that can demonstrably upgrade yarns made from a particular quality of cotton. It is, in the first generation terms an ideal way of making yarns from short stapled cottons and of making high quality yarns.

Open end yarns quite different from open-end ones

They should not be looked at as simple alternatives to ring spun yarns as the characteristics of open-end are quite different and while for certain end-uses they are perhaps inadequate, they offer other applications distinct advantages. In say warping and sizing and open-end yarn will behave in a characteristic way.

One mill manager in a UK weaving shed commented about using open-end as warp yarn 'I only wish they sent me all my warp yarns from the open-end spinners because they run much better than the ring spun.' This is not because they are weaker than ring yarns but because they are more consistent with less irregularities and when this is recognised in the warping department it becomes possible to produce warps that are of improved quality and which can be run off faster than the old type. Perhaps one of the most telling things about open-end spinning on rotor machines can be demonstrated by the situation at two mills. The first of these is the recently opened plant at Sennar which is on the Blue Nile in Sudan. In this plant which is 100% ring spinning, but which produced a substantial proportion of combed yarns, all the comber waste is simple bagged and dumped on a rubbish tip!

The other mill is in the Irish Republic and here there is a section of combers and here a single Platt Saco Lowell rotor spinning frame has been installed and now all the comber waste is blended with virgin fibre and the mill is selling its waste as quality yarn! This is perhaps the most significant aspect of the new process.

In America 3,000 farmers are demonstrating how their short staple cotton can be spun into quality cloth; in Ireland it is being used to make condenser-type yarns for sale whereas in the past it was sold off as waste, while in the Sudan it is being dumped.

In many respects rotor spinning is simpler than ring spinning although the initial investment might well be somewhat higher. It is not a complex process, but it is one that demands cleanliness both in the mill and in the raw materials. Today there are a number of companies that can supply machines that will spin open-end yarns across a wide range of counts and with varying degrees of sophistication, but it becomes perhaps ever more evident that it is the first generation and perhaps even 'slow' machines operating at say 45,000 rpm that offer the greates attraction to a developing industry.

Among the machine builders that can supply complete plants of this kind are: Platt Saco Lowell Ltd., of the UK. Maschinenfabrik Rieter A.G., Switzerland; Schubert & Salzer Maschinenfabrik A.G., W. Germany; Investa Ltd., Czechoslovakia; S.A.C.M., France; Barber-Colman Co., USA; Marzoli Fratelli & S., S.p.A., Italy; Zinser Textilmaschinen G.m.b.H., W. Germany; W. Schlafhorst & Co., W. Germany; Nuova San Giorgio S.p.A., Italy; Befama, Poland; Toyoda Automatic Loom Worls Ltd., Japan. These are the most internationally active of the rotor spinning frame builders, although there are others in the trade who are perhaps less well known or even more specialised.

In a recent American textile publication it was noted that gradually the manufacturers are coming to specify their yarns needs to be made on the open-end system rather than the classical ring spinning and it is felt that as a direct result of this it could well be that it is not far away in the future when spinners will be able to command a premium on those of their yarns that are spun on the new machines. Not only are lower quality cotton upgraded in yarn terms, but yarn properties are much improved. □

Synthetic Fabric produced without weaving

A METHOD of producing a plastics filament web without the cost and complexity of a weaving process has been developed by the Wissenschaftlich-Technisches Zentrum (WTZ) Technische Textlien of Dresden, E. Germany, where two plants are already in operation. Building and world sales of the system is the subject of a licence agreement between Reifenhauser KG, Troisdorf-Siegler, W. Germany and WTZ.

Known as the 'Reicofil Spin Bonding' process it consists basically of an extruder, a spin beam and spin pumps all of which are mounted on a platform. Filaments from the extruder are spun through spinnerets and are laid in random fashion by an aerodynamic orienting unit on a screen-type conveyor belt as a fleece. Output from the extruder remains constant and required weight per yard of the finished fabric is adjusted by altering the speed of the conveyor belt.

After laying and dependent on the plastics used, the fleece is passed either through a calender — a chemical bonding tank containing an emulsion — followed by drying around a drum, or is passed under a needle beam which consolidates the filaments. The edge of the web is then trimmed and it is wound in the usual way.

When demonstrated, the process was limited to the use of Nylon filament which can be chemically bonded and to polypropylene which can be needle bonded. Later development work will aim at solving the problems which at present are associated with the spinning of polyester materials.

West African TEXTILES

The demonstration seen in Germany operated on Hoechst 'Hostalen' polypropylene using a 3½ in Reifenhauser extruder and four spinnerets each having 420 die orifices. Output was 175 lb/hour equal to an approximate web weight of 10 oz/yard² (300 gram/metre²). The web width of 47 in was produced at a linear rate of 250 yards/hour.

Advantages of the system are that as it can be set-up at ground level building costs are low, the technology is comparatively simple while the versatility of the line both in its units and its ability to handle different polymers and web thicknesses make it suitable for the smaller plant producing a wider range of end products.

The fabric can be printed by flexographic or heat transfer methods but dyeing of the fabric presents some problems and thus colours are better produced by using coloured granules. Applications for the fabric are many and include curtaining, furnishing covers and book covers. When impregnated with plastics such as PVC it can be used for upholstery, car seating and door panel lining. In civil engineering it has applications as a substrate beneath temporary roads, airfields and sports grounds. Being a membrane which withholds solids but allows the passage of water it ensures stabilization of the ground with the minimum of cost and labour. It also has good heat and sound insulation properties and thus has many appliations in the building industry. Technical applications are currently in filtration.

Sequence of operations

Chemical bonding	Mechanical bonding
Granule	Granule
Extrusion	Extrusion
Spin beam	Spin beam
Spinnetet	Spinnetet
Orientation	Orientation
Fleece collecting	Fleece collecting
Chemical bonding	Needling
Drying	
Trimming	Trimming
Winding	Winding

□

Bentley Engineering for socks

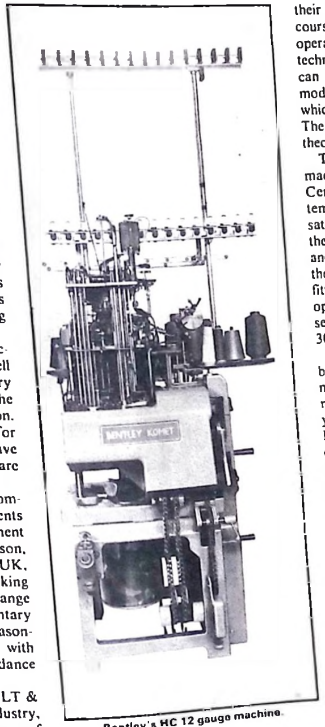
s becoming a noteworthy fact that
e there is an increased interest in
ia for light industry as an initial
ess venture, several of the developing
ries are turning to the manufacture of
ks.

It is a natural progression that more and
re socks are required as the world popu-
tion increases, but apart from this,
ur travel has brought the need for
ferent footwear to suit the various condi-
ns and differing climates. It is strong
ed that in turning to sock manufacturing
e capital investment needed is small in
mparison to many other textile
chinery requirements. It is also a fairly
ompatible industry with the natural yarns
ailable and the yarn producing plants
ng starting up in many developing
untries.

It is therefore advisable that the prospec-
e manufacturers approach the well
tablished companies making machinery
r a wide range of models varying in the
chnical skills required for their operation.
his is obviously most important, for
ically the well established companies have
ir 'back-up' for training, advice and spare
rts.

Supplying machinery which is too com-
licated in the initial stages, prevents
eady production, growth encouragement
d stifles any enthusiasm. For this reason,
Bentley Engineering Co. Ltd., of the UK,
e largest manufacturers of sock making
achinery, have amongst their wide range
of models available, a more elementary
group of machines which are still reason-
ably simple to operate and maintain with
ew labour, providing some initial guidance
s given.

The Bentley 'Komet' models BR, LT &
HC are most suitable for a new industry,
the design is well established, the range of
diameters and gauges is wide, from 2½ to



Bentley's HC 12 gauge machine.

Samples as produced on the LT model.

25 needles per inch are covered by the 3 models. Thus the customer can extend his range of products as the 'know-how' increases but he is still able to use the same level of labour, as the basic mechanisms of the models are extremely similar.

One popular model is the BR two feed, double cylinder machine for plain and rib footwear. This is the most simple model in the Bentley range of double cylinder machines. It is designed primarily for the production of men's, women's and children's hosiery, either with 1/1 top and plain, single or broadrib leg, or plain top and ribbed leg. It is built in a very wide range of gauges and diameters and whilst the basic model is equipped with all the essential attachments, there are many further optional attachments available. These include extra facilities for striping, plating and splicing etc.

The Bentley Eng. Co. Ltd., has especially concentrated on assuring that suitable training facilities are available for their customers employees and special courses are run to enable new labour to operate the more elementary models. Those technicians already skilled to some degree can also obtain further training on new models and a new school is being opened which will also cater for this requirement. The emphasis is on the practical more than theoretical instruction.

Textile machinery is no different to other machines where the climate is concerned. Certain conditions in humidity and temperature are more ideal for the satisfactory operation of the machines and the recommended figures are between 45% and 50% for humidity and 18° to 21°C for the temperature. The standard motors fitted to the Bentley 'Komet' machines operate satisfactorily up to 6,000 ft. above sea level and can be subjected to up to 30°C in temperature.

Requirements outside these figures can be provided by special windings in the motors. Many such specialised mechanisms have been adapted over the years during the time the Bentley Eng. Co. Ltd. has been supplying machinery to every part of the world. The situation now arises whereby due to the complexity of choice it is extremely difficult for the new customer to choose the most suitable machinery for his requirements.

Consequently, guidelines have been laid down with regards to some of the factors governing the customers demands:

a) Age group of market to be supplied.
b) Counts of yarn available.
c) Types and styles of articles to be produced.
d) Capital investment available.

West African TEXTILES

It will be seen that the recommended sizes for men range from 3½" x 200 needles to 4" x 176 needles.

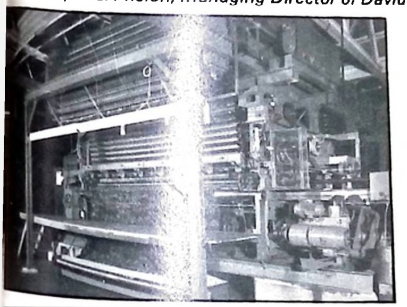
The majority of the world population use the 4" x 168 or 4" x 176 machines for their main source of everyday mens wear but in countries where higher temperatures are a dominant factor, the 3½" x 200 No. 15A gauge machines are more suitable.

When the gauge become finer, the skill of the operator becomes more acute and for this reason the No. 15A gauge is more suitable than the No. 20A gauge machines when commencing in business, using a new labour content.

Therefore it will be seen from the above short article before venturing into this industry, considerable advice is necessary and it must be emphasized that a well established company with decades of experience in new business, freely gives this information to suit each particular situation and requirement. □

WEAVING TECHNIQUES for Gripper Axminster Carpet

by G. E. Phelon, Managing Director of David Crabtree & Sons Ltd.



A 400 cm. wide, 7 pitch spool gripper Axminster carpet loom.

IN THE principal carpet producing countries of the world the system of producing woven Axminster carpets by the Gripper loom method has long been established. This method has always been highly popular mainly on account of the maximum economy in materials usage which can be obtained in the Gripper loom and also because of the high colour potential which is available to the carpet designer using the Axminster method.

The Gripper Axminster carpet loom is produced in two broad types by David Crabtree and Son Ltd. of the UK, and these are the Gripper-Jacquard Axminster carpet loom and the Gripper-Spool Axminster carpet loom. With the former type Jacquards for 8-frame or 12-frame operation are supplied as required which allow for different colour maxima in the carpet designs of approximately 20 and 30 respectively. Whilst the 8-frame type only allows for a maximum of eight different colours in linear measure by distributing the colours across the full weaving width a maximum number of approximately 20 can be obtained in any one design. Similarly for the 12-frame type a greater number of colours can be obtained in the same manner. Thus even with the Gripper-Jacquard Axminster loom a wide variety of colour options is open to the choice of the carpet designer.

With the Gripper-Spool alternative the colour availability is totally unlimited and thus the carpet designer has a complete and total availability of colours at his disposal for inclusion in the carpet designs. In all other respects the weaves produced by the Gripper-Jacquard and Gripper-Spool Axminster carpet looms are identical.

Different weaves are available with these looms, the two most common being the 'Kardax' type in which the full pattern is seen on the reverse side of the carpet, and the 'Corinthian' type (also known as the ridge-back weave) in which the pattern is not seen on the reverse side of the carpet. The Kardax type is usually employed for rugs and carpet squares whereas the Corinthian ridge-back type is employed for wall-to-wall carpeting. The change-over from one type of weave to the other can be effected quite easily by changing the relative positions of the weave formation cams which are mounted in such a way as to facilitate this operation.

West African TEXTILES

In addition to these different ground weaves the looms can be adjusted also to produce the long pile shag or rya type carpeting which is very popular in Western Europe and America. These long pile carpets and rugs are particularly suitable for use in bathrooms and bedrooms.

Thus it will be seen that these Gripper Axminster looms have a versatile production capability being able to reproduce hand-made oriental type carpets and rugs in which the pattern is seen in full on the reverse side of the carpet and also being able to produce for wall-to-wall fitted carpet production the ridge-back type of weave. Both these ground weaves can be utilised with the long pile or normal short pile types of production but normally speaking the Kardax, through to the back weave, is used for long pile weaving, for this provides a more secure tuft-lock which is prefereable with long pile.

In addition to the advantages of Gripper Axminster carpet production already described, this system, whether it be with Jacquard or Spool type, provides the utmost economy of weaving materials for the carpet production. All the pile yarn is used at all times in the carpet surface there being no hidden runners of 'dead' pile yarn embedded within the carpet backing itself. This results in a very considerable saving of expensive pile yarn material with Axminster for the buried yarn which is present with all patterned Wilton carpets is virtually waste yarn which has to be paid for in the price of the materials used in the carpet production. This fact should be closely related to the availability of 8-frame and 12-frame Jacquard machines with the Gripper-Jacquard Axminster looms which compare most favourably with the 5-frame Wilton capacity which is the normal maximum found with that type. Thus with the Gripper-Jacquard Axminster not only do we have a much greater colour potential for the carpet designs but we also have a much greater economy in the use of the principal weaving materials.

In recent years the Gripper Axminster looms of both types produced by Crabtree have been very considerably improved in the mechanical design with particular reference to speed of operation and carpet output. This is particularly true of the Gripper-Spool version which now operates at speeds of between 100% and 150% faster than looms of similar design which were built some ten years ago. On the Gripper-Jacquard side similar important mechanical developments have taken place resulting in speed increases of some 35% compared to machines which were built some ten years ago.

For the carpet manufacturer who is planning to introduce a plant of new machinery for the production of colourful fully patterned carpets there is no doubt that serious consideration should be given to the installation of either Gripper-Jacquard or Gripper-Spool Axminster machines. From a world-wide point of view the Axminster loom has a particular significance and importance for it is capable of producing carpets using a wide variety of yarns. For example all-wool, wool/synthetic mixture yarns and 100% synthetic yarns can be used with equal facility in these machines so that the greatest economy and utilisation of locally available materials may be employed. In addition the warp and weft material can vary in accordance with the particular requirements of any given manufacturer commonly used constituents in these cases being for warps polypropylene, cotton, terylene and jute; whilst for the weft polypropylene, jute and linen are commonly used. □

Textile Digest

fabric forming

combination of knitting and ving has been achieved in chechoslovakia with the oduction of a machine own as Metap and which is rketed through **Investa A.S.** d present the machine is ited to a production width of cm. maximum although ximum fabric can be made ine operates at speeds of 400 to 700 r.p.m. The sett of the th in fabrics can be varied m 5 to 50 threads/cm. and it supplied from beams with rge diameters of 500, 600 or 700 mm. diameter, while the cloth take-up has a maximum roll diameter of 50 mm. Fabrics from 50 to 30 grm/sq.m. can be produced.

Basic construction of cloth made on the Czech Metap machine.

Warps are produced in the conventional way that is used for traditional looms and the new system can be used to produce a fairly wide range of cloths. The feature of the new system is that it is basically simple and so is reliable in operation with a minimal number of stoppages.

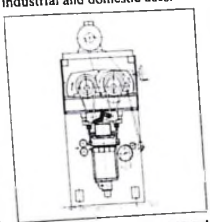
Two weft threads are inserted with every revolution of the machine so that with a machine operating at 500 r.p.m. it is effectively inserting 1,000 picks per minute although the weft is in fact being laid across needles and stitched into the fabric rather than as a continuous strand being projected as in a classical loom. Because of this relatively short distance of insertion the machine can operate at any width without affecting the speed of fabric production.

The new type of cloth is described as a knit-woven by the Czechs and all cloths made in this way are produced in a double-pick weave construction. Examination of fabric produced on the machine reveals that between 75 and 85% of the cloth is woven, the remainder being knitted. The basic construction of fabrics made on Metap are shown in the drawing.

Blankets — faster and cheaper

Although blanket production is not a vast market there is a constant need for them and while blanket making and blanket finishing by the classical routes is a rather complex process there is a growing market for strong, dimensionally stable blankets based on a combination of either a fibrillated polypropylene warp and needle punching or the use of a polypropylene woven scrim used as a reinforcement for a needle punched fabric.

A company that has made considerable strides in the development of needle punching as a technique is **Asselin** of France which not only produces needling machines but is also equipped to undertake turnkey projects for such products as floor and wall coverings, artificial leather and a wide range of products for both industrial and domestic uses.



Schematic showing the general drive system of the Asselin needle looms.

The Asselin looms are based on the use of two contra-rotating drive shafts controlled by a Citroen herring-bone bearbox which drives the needle beams by connecting rods and which are guided by a system of articulated links with fulcrums on the frame.

S ripper plates can be adjusted manually or through motors by means of mechanical jacks.

In the latest tacker a web of fibre is taken through two perforated cylinders and while nipped in this way the needle board inside the cylinder punches through it and so tacks the web with only a minimum of drafting. This is preliminary to the material being fed into a standard needle punching loom where it is possible to punch either from one side or simultaneously from above and below.

Normally for blanket production there are three machines with opposing boads that can be used to give simultaneous or reciprocal punching. The machines are:

Model
1080-DF two opposite needle boards; 1000 strokes/min.
900-DF Four opposite needle boards; 1000 strokes/min.
663-DF Eight opposite needle boards; 850 strokes/min.

These machines process from 2.5 to 5 metres width and as well as being ideal for blanket manufacture can also be used to process say filters, spunbonded and various other types of substrates.

The Shuttleless loom excells

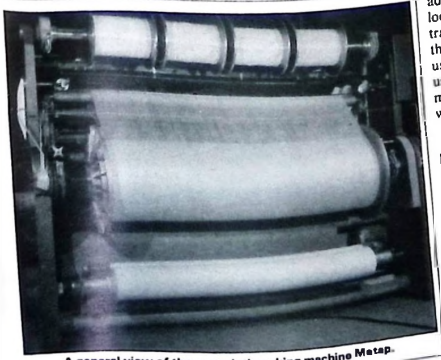
One of the most well known shuttleless looms now being used throughout the world, operates on the principle of using a projectile to carry the weft from a package on one side of the machine to the selvedge on the other. Competing with this system for some time has been that in which rigid rapiers advance from both sides of the loom and 'kiss' in the centre, transferring weft from one to the other. This is the system used by **SACM** in its widely used MAV looms of which more than 20,000 are weaving worldwide.

Now the French company has developed a completely new MAV rigid rapier loom called the DN 175 which has twin rapiers on each side and which simultaneously produces two fabrics, one above the other. This is likely to be a major competitor of the projectile-type looms as it offers a number of distinct advantages. It is claimed that working costs — power requirements, area occupied, maintenance etc. — are the same as the looms making only a single fabric, but that its production is some 65% greater.

In addition to the 175 there are two other models of the machine, the 190 and 205, these being wider working width machines.

It is pointed out by the company that weaving 'double cloths' is hardly new and has long been applied to weaving velvets — an area in which SACM is a major loom supplier — so that already there is a considerable amount of experience available to back up this new development.

Model	Width without selvedge waste	Picks/min.	Speed r.p.m.
175	169 cm.	440	220
190	187 cm.	420	210
205	202 cm.	400	200



A general view of the new cloth making machine Metap.

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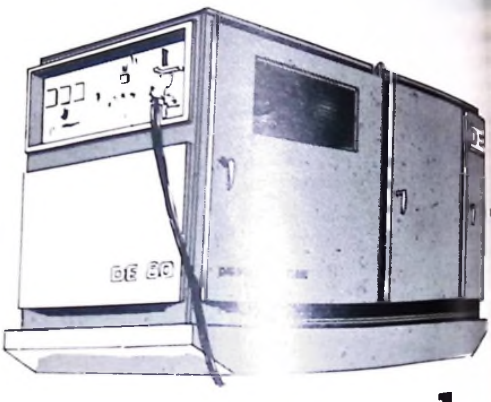

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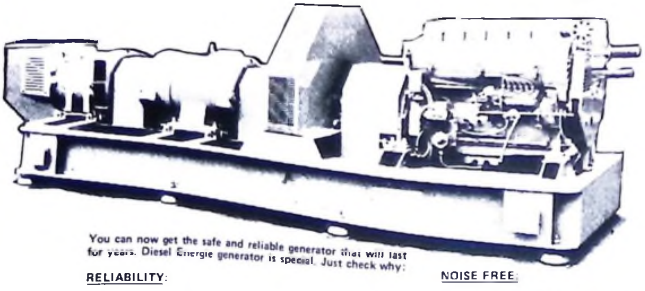

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New products from BASF

Several new textile auxiliaries and dyestuffs have been introduced by **BASF UK Ltd.**, Textile Division.

Kaurit MH is a crosslinking agent developed from melamine and is used for fixation of cellulosed, Schreiner and chintz finishes on fabrics and for easy-care finishing. It can be used on all types of cellulosic and blend fabrics.

Three Blankit compounds are used for reduction of bleaching effects with a high bleaching power to give various shades of white are launched. Blankit IIA and B is suitable for cellulosic fibres while the other are mainly for use on wool.

Cylanon R is intended for dry-cleaning fabrics that have been dyed with disperse dyes and it develops its reducing effect in alkaline baths and is also said to have a 'handle-modifying effect'.

Acidol Blue FRE is an anthraquinonoid levelling dye that is particularly suitable for use on polyamide (nylon) fibres to give a brilliant blue. Indanthren Black BB Colloisol is a new liquid dye made from the powder N form and can only be applied by the exhaust process and only after concentrate starting, but it can be applied by all dyeing processes. Basacryl Green X-BF is another liquid dye that has high tinctorial power and is intended mainly for outerwear.

Palanil Brilliant Yellow FRL is a disperse dye for polyester and is reported to give a brilliancy of a level that until now has been unattainable. Preferably it is used at high temperatures or with the Thermosol process. This too is available in liquid form. Another yellow, but with a greenish shade is Palanil Luminous Yellow G Liquid which can be applied by all dyeing and printing processes and which is insensitive to iron ions and substances with a reducing effect.

Another black from BASF is Basacryl Blakc X-GR Liquid which has high tinctorial strength and is intended for the production of deep, bloomy blacks on fabrics for the outerwear trade.

Testing cotton maturity

Gradually it is coming to be accepted that there are certain standard ways of testing cotton to measure the degree of maturity of the fibre. Increasingly it is coming to be accepted that the universally acceptable system which gives results that can be quoted meaningfully in any market is that which was developed by the **Shirley Institute** in Manchester, UK, and which is now marketed by the IIC-Shirley Fineness/Maturity Tester. Already about 60 of these testers have been sold by **Shirley Developments Ltd.**, and now it has been approved as the standard by the Japan Spinners' Inspecting Foundation and will in future replace the system of Japan Industrial Standard that previously was used to check maturity.

2-for-1 represents savings with simplicity

An increasing number of textile manufacturers are producing yarns on 2-for-1 twisters as this is proving to be the most economic way of folding singles yarns and producing large, knotless packages. **Muschamp Ltd.**, is building two machines of this kind. The model 353 will operate from a package with a maximum traverse length of 255 or 355 mm., and produce a take-up package of maximum traverse 255 mm., while the spindle speed is adjustable to a maximum of 7,500 r.p.m. The model 530 is intended for larger packages and can take packets of 280 and 330 mm. diameter, compared with 280 mm. on the model 353, but with traverses of 255 and even 405 mm., while the take-up package which is a maximum of 356 mm. diameter on both versions, can, on the big machine be 255 or 305 mm. traverse. Obviously the spindle speed of the bigger machine is limited by diameter and this will be a maximum of say 6,000 on the bigger packages and 7,500 on the smaller.

The 353 is built with 12 to 96 spindles in units of 12, while the 530 is built in units of 8 from 8 to 64 spindles.

Tubular knitted cottons

All cellulosic fabrics can be improved by mercerising but until recently the only way tubular knits could be treated in this way was to mercerise the yarn. Now a completely new system of mercerising tubular knitted cottons — and rayons — has been developed in Italy by **Omez S.p.A.** and it is able to process the fabrics in various widths and at high speed. In the new machine tubes of different diameter can be linked so they increase in width and automatically the machine will compensate for the change in width, expanding to accommodate a wider cloth automatically and without loss of production speed which can be as much as 30 metres per minute.

The cotton fabric is treated with a caustic soda solution and held under a controlled tension while it is being washed off in a tower. The secret of good mercerising is to get the caustic soda solution into the fibres of the material and then remove it as quickly as possible while maintaining a controlled degree of tension. Not only does this ensure an excellent improvement in lustre, but in one Italian mill where the process has been under development on a commercial scale it has been found that there is an improvement in the receptivity of the material to reactive dyestuffs.

Open-width washing

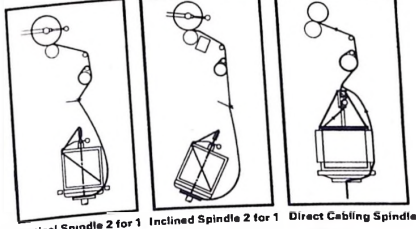
Efficient washing of fabrics in the open-width is important in that the amount of waste water has to be controlled and the problems of treating such effluent is critical if pollution levels are to be kept to a minimum.

In France **Air Industrie, Amdes Division** has recently developed a multi-stage, counter-current open width washing system through which the fabric passes in one direction and the wash-off water travels in the opposite direction. This company is increasingly active in the development of completely new technologies within the textile trade and with this new system it is claimed that there is an increased efficiency on the transfer of heat from coils in the bottom of the tan to the water and a considerable increase in machine operating efficiency compared with the so-called vertical system of washing-off.

Using say 10 litres of water per kg. of fabric and heated from 15 to 60°C. (60 to 140°F.) only 0.45 Th/kg. of fabric are used. With say 2.5 litres/kg. and at 95°C. (200°F.) energy of 0.2 Th. (1,800 B.T.U.) is required which can be calculated as 0.2 Th x 1,000 = 200 Th./hour (800,000 B.T.U.) for a production rate of say 1,000 kg./hour and such a saving would represent sufficient fuel to operate at least two stenters.

The machines are built with either vertical or inclined spindles for 2-for-1 twisting or there is a direct cabling arrangement which in fact does not insert a double twist for every revolution of the spindle but in fact is a one-for-one twister.

Compared with old systems it is claimed that with the new machine a saving of 15 to 20% in capital costs is possible, while 40% can be saved on power consumption and 50% on direct labour and in terms of production per unit floor space the saving can be as much as 30%.



Vertical Spindle 2 for 1 | Inclined Spindle 2 for 1 | Direct Cabling Spindle

More information may be obtained on any item by using the form facing page 200.

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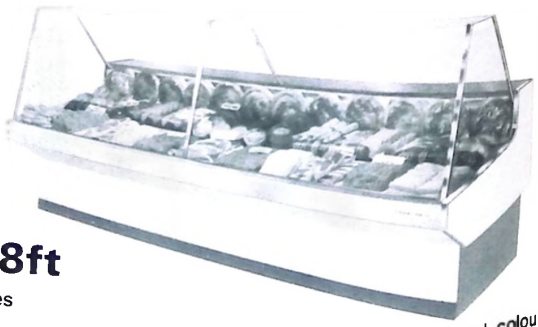

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The front view of a very modern unit cleaning shop with a Spencer machine in the background. The automatic device on the right permits customers to collect garments at any time of the day or night by insertion of a pre-paid control card. The unit automatically identifies individual garments from storage rails.

DRYCLEANING
AN ALTERNATIVE WASH

Drycleaning is a relatively new method of removing dirt and grime from textiles and garments. In this article E. Albinson F.G.C.L., looks at recent development trends within the drycleaning industry, and the potential this cleaning method offers West Africa.

RYCLEANING by comparison with undering is a relatively new means of moving soil and stain contamination om textile articles and garments. ccording to historical records it dates ck to 1825 when a servant of a Mon- ur Jean-Baptiste Jolly accidentally set a paraffin lamp over a coloured tab- cloth. Mr. Jolly observed that after dry- g the sections of the cloth which had en oil saturated were free of soiling and aining. Experiments soon determined at paraffin was not an ideal solvent and entually benzine was decided upon as ing the most suitable for commercial velopment.

M. Jolly was associated with a M. lin in operating a dychouse which entually traded under the name of Jolly-Belin. M. Jolly's son and grandson were responsible for introducing solvent cleaning techniques into dychouses and textile finishes to Spindlers in Berlin and then to Pullars of Perth in Scotland. Pullars were responsible for converting a manual process to a machine operation. The first patent for a mechanical drycleaning machine was taken out in Paris in the late 1860's to be quickly followed by a series of other patents. It is interesting to note that many of the early machines were in design and principle an intelligent anticipation of the modern totally enclosed cleaning unit.

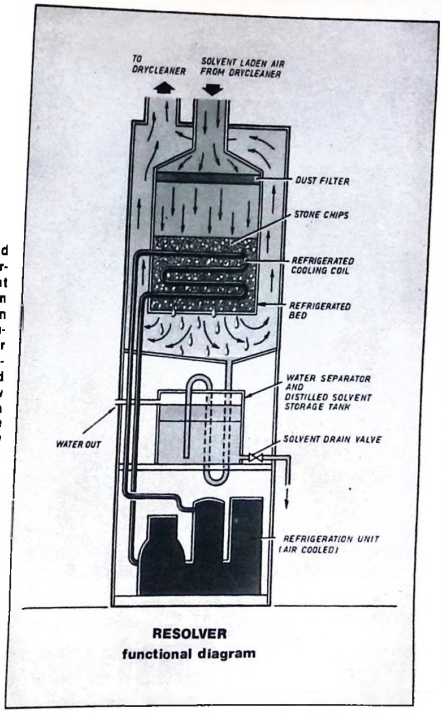
By the early 1900's petrol was in common use in the United States and benzine in this country. Both solvents were highly inflammable and stringent regulations such as separate buildings inhibited the development of drycleaning. By 1930 the most commonly used solvent was Stoddard Solvent i.e. white spirit petroleum solvent. Carbon tetrachloride was the first non-flammable chlorinated hydrocarbon to be used for drycleaning purposes. The first such machine was developed in Germany in 1930 which made it possible for drycleaning to be undertaken in shop and retail premises.

Carbon tetrachloride whilst being non-inflammable had the disadvantages of being highly toxic to operators and very corrosive to plant and equipment. The immediate alternative was trichloroethylene which as a solvent dates back to 1918 but was not used on any

continued

...ilable until the mid 1930's. this sol-...ionally in the U.K. gave way to ...oroethylene from 1955 onwards ...because of its higher safety factor ...ect of colour damage to fabrics ...of acetate or triacetate rayon. By ...it was estimated that so far as the ...it was concerned approximately 85% ...drycleaning was undertaken using ...chloroethylene, 3% with trich-...ylene and 12% by white spirit. ...ently, trichloroethylene and white ...are used only for industrial dr...clean-...but an even safer chemical ...vent ...is being used to the extent ...nearly ...of the domestic cleaning ...et.

The proportions of the alterna...e sol-...s used in different countri...aries ...ding to their availabili... cost, ...ce and quantities of articles...ments ...e drycleaned. For exam...in the ...tes Stoddard Solvent (white ...pirit) is ...d to the extent of 50% of...e total ...rket because of low costs, t...umber ...refineries and retention of ...tralised ...leaning plants. In most of E...ope the ...n drycleaning turnover is v...self con-...ned plants operated in retail shop pre-...ses which limits because of fire risks ...the choice to perchloroethylene and to ...Solvent R113.



A Nell and Spencer refrigerated solvent recovery system developed as an alternative to conventional water cooled condensers, it is claimed that this new method can almost double the solvent efficiency of a cleaning machine.

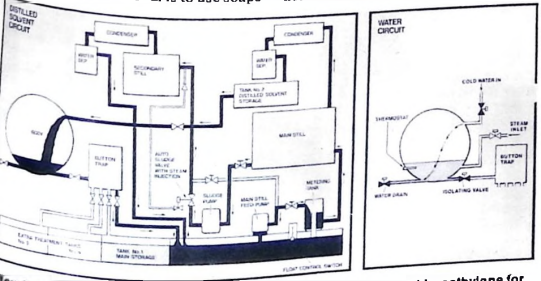
RESOLVER
functional diagram

Development trends

When examining drycleaning development trends it is important to assess them within the context of a number of relevant factors. First, it is necessary to differentiate between dry and wet methods of removing contaminants from textile articles/garments and in particular the nature and extent of the impurities. In cities, towns and communities likely to be involved in industrial activities or subject to exhaust fumes of one sort or another most of the solid soiling will be surrounded by a film of oil or greasy matter to which according to ambient conditions must be added oily/greasy matter from perspiration and also from the means of domestic heating or cooking.

In a washing or laundering process the mechanism of dirt removal is to use soaps or detergents which emulsify the oil/greasy material and by reduction in surface tensions allow the particles with the aid of manual or mechanical means, to be released from the fabric. The soap/detergent then has to function as a suspender of the released impurities in the wash liquor until the water can be discharged to the drains. By comparison, in dry-cleaning solid soil particles are released by the solvent dissolving the oil/grease films and the machine mechanical action dislodging the dirt from the structure of fabrics.

Next, all wet processes exert a swelling action on most textile fibres; they can distort the shape and set of both the fabric and structure of a garment and the soaps/detergents can affect dyestuffs This explains in some degree as to why the choice of a wet or dry process is determined by the nature, value and fibre content of the article to be cleansed. At the risk of generalising, underwear garments, bed and tablelinen, cotton fabric outer articles are usually cleansed by washing but more expensive outer garments such as suits, coats, fancy or evening dresses are processed by the use of dry solvents. An apt comparison of the safety factors of wet and dry processing is the fact that paper currency can be safely dry-cleaned whereas it would completely disintegrate if washed.



low lines of a typical cleaning machine using both water and perchloroethylene for ne cleansing of workwear overalls.

Assessing market potential

Therefore, the market potential of a domestic dry-cleaning service must be assessed in terms of the volume of work in any given locality which demands the safety of a dry process. In other words a sensible relationship has to be determined by the population density; the proportion likely to wear dry-cleanable garments and the amount which can be afforded per head of population. Experience in the Western world indicates that the most likely appeal to potential customers is via complete self contained

continued

...ntinued

...ing retail shops. There can however ... some advantages in operating a ...ber of retail collecting shops and ...ertaking the processing in medium ...d centralised plants. It must how... be stressed that the economics of a ...tralised plant are determined between ...e distances and costs likely to be ...olved in collecting work from and ...turning to the originating sour...

Rear view of industrial mac... showing ...ined unloading position.

A modern unit dry-cl...ing plant undertakes in the one machine the functions of solvent cleaning, extraction of surplus solvent, final removal of solvent and also contains the means whereby the expensive chemicals involved can be recovered and re-used. Unavoidably, such a number of related functions undertaken in sequence order require sophisticated and expensive units but fortunately apart from maintenance most machines because of automatic controls are not over-demanding in the way of operator skills. Such cleaning units have to be complemented by pressing and finishing equipment to restore the original handle and appearance and so conform to the essential requirement of returning garments to their owners in as near new condition as possible.

Fire hazard

As previously stated, even when available from local or national oil refineries white spirit cannot be safely used in unit shop cleaning premises because of the high fire and explosion risks which can be involved. By comparison, perchloroethylene is an expensive solvent which means that it must be used with maximum efficiency otherwise profitability will be affected. Efficiency is usually assessed in terms of solvent mileage i.e. weight of work in terms of solvent volume usually lbs. dry weight per gallon or kilos per litre according to which system of measurement is preferred. The variations which can occur can be judged by the fact that in the UK the weight of work per gallon of perchloroethylene can vary between 120lbs and 750lbs.

The reasons for such extremes of mileage are associated with the design of a dry-cleaning plant and in particular the effectiveness of its solvent purification and recovery systems. Solvents in use acquire two types of impurities — those which are dissolved in the solvent and the solid soil particles released by degreasing from the articles being processed. During the wash cycle of a cleaning process solvent is allowed to continuously flow through filters which effectively removes most of the particle impurities. The amount of dissolved contaminants is kept under control by a constant withdrawal of small quantities of solvent to a still (or equivalent system) and its return in pure form to the solvent stock tanks.

Removing the solvent

At the end of a wash cycle excess solvent is removed by high speed extraction on the same principle as used in a laundry washing process. At this stage the loads being cleaned still contain a high percentage of solvent which is removed by tumbler drying using air to speed up the operation. In the case of white spirit the solvent vapours are usually discharged to the atmosphere but because of the higher cost of perchloroethylene the economics of the process demand the vapours be condensed and returned back to the machine for re-use. If machines are not well designed or incorrectly operated or inadequately maintained a large proportion of the recoverable solvent can be discharged to the atmosphere. Apart from the waste in terms of cost it is essential to always bear in mind that in most countries it is illegal for reasons of environmental pollution to allow perchloroethylene vapour to contaminate the atmosphere both externally and in the working area.

A large modern industrial solvent cleaning machine with a loading capacity of 150kg for use on workwear clothing and a wide range of textile purposes.

The recovery and purification of solvents involves the use of energy in terms of power and heat the cost of which must be offset against the value of the perchloroethylene saved. In recent years machinery manufacturers have developed a number of alternative methods most of which are less costly to work and certainly less demanding in operator and maintenance skills. For example, new types of cartridge filters remove both soluble and insoluble impurities and refrigerator type recovery/condensation systems can be used instead of expensive and bulky equipment using activated carbon.

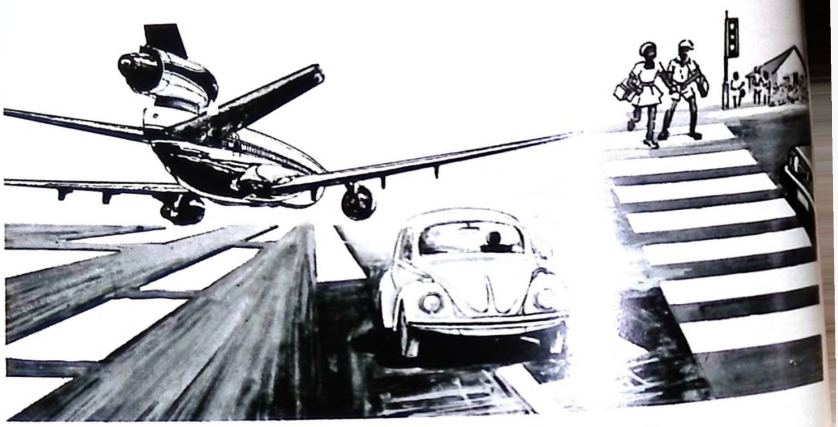
Until recently there has always been a rigid distinction between dry and wet cleansing of textiles in respect of method, principle and the type of articles to be processed. For the majority of textile articles washing in the sense of laundering is more satisfactory but it does require the availability of adequate supplies of water at a sensible cost and also facilities for eventual discharge to waste. Laundering also requires considerable quantities of heat for drying and finishing purposes. By comparison, solvent methods of cleaning require minimal amounts of recoverable water for cooling purposes, the solvent can be used repeatedly and the amount of heat required is considerably less than would be required for wet processing. Methods and equipment are now available which literally wet wash in dry solvents with many variations to satisfy individual needs.

Combination washes

In these newer systems it is possible to undertake a first wash in water to remove certain types of soiling and to follow with a second treatment using solvent only or to use combinations of both solvent and water up to 50 per cent of each in the same process. In other words a dry dirty load can be put into a machine and a dry clean load requiring little or no finishing can be removed at the end of the process. The availability of such equipment also means that according to circumstances the same machine can be used as a conventional washer extractor tumbler, as a normal dry-cleaning machine or for multi-sequence processing. Such developments follow the trend in textile dyeing and finishing techniques in which solvents can be used instead of water and so overcome water supply problems.

Again, it has always been customary to limit dry-cleaning to the processing of personal outer clothing whereas in fact it has many industrial applications such as the degreasing of skins, feathers, industrial wipers, etc. Solvents in recent years have steadily replaced aqueous means of scouring, milling and dyeing of knitwear. Solvent processing has now established itself as an alternative to wet treatments in a wider range of textile applications than was ever envisaged by its innovator Monsieur Jean-Baptiste Jolly in his dyeworks.

In areas such as West Africa the potentials of solvent processing in domestic, industrial and textile markets should be given very serious consideration. In other parts of the world the pattern of processing has been established by convention, custom, availability of materials, etc. The result is a diversity of complex interests each concerned with specific activities whereas recent experiences and known developments suggest that there could be many advantages from the centralising of multi-purpose solvent machines covering a wide range of trading activities. □



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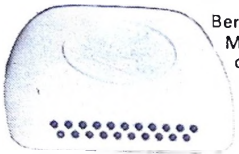

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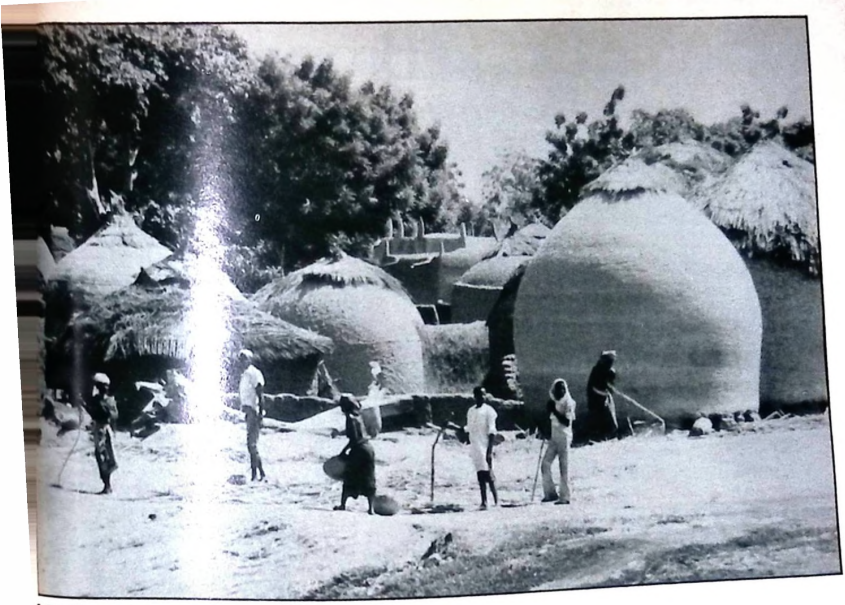


Traditional Stores — Integrated within the village.

RURAL DEVELOPMENT

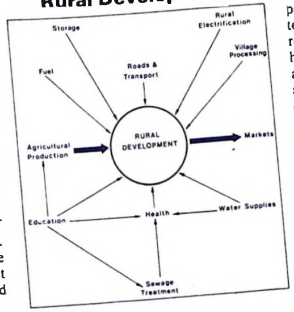
The Small Farmer's Role

In this, the fifth of the articles from Minster Agriculture, Dr. John Meadley argues that the potential for increased agricultural production in West Africa, particularly food production, lies substantially with the small farmer.

THE DEVELOPMENT of the Rural Areas is of crucial importance in most parts of the developing world. They provide the livelihood for the majority of the people and are also the main source of food for rapidly growing urban populations. Development of the rural areas involves both improving the living standards of the rural population and increasing agricultural production — the two are clearly closely inter-related.

The *problems* in rural development are immense — small communities scattered over vast areas, inadequate transport and communications, and strongly held traditional views on many aspects of agriculture, land ownership and allocation. The diffuse nature of the problems and the scattered population make the efficient utilisation of available resources and expertise difficult.

Major factors in Rural Development



Many factors are involved in rural development. These include social structures, traditional and national law, politics and finance and many specific technical disciplines including agriculture, roads and communications, education, health, water supplies, sewage treatment and electrification. (Some of these factors and their relationships are shown in the diagram overleaf). The development of any *one* sector may be limited by problems or constraints in *another* and it is for this reason that both Governments and international development agencies now stress the need for *integrated* rural development.

Approximately 70% of the population of West Africa live in the rural areas — some 100 million people living on 10 - 12 million small farms. Agriculture provides the base of all the West African economies (except

Continued

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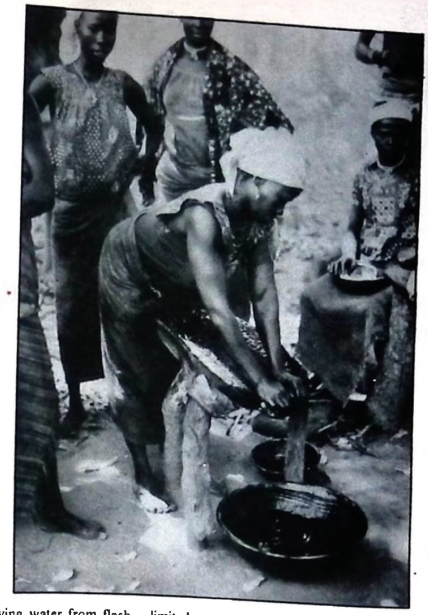
...and agricultural production is ...ed entirely from the rural areas. It ...s therefore that the potential for ...ased production, and economic ...th lies in the rural areas and sub...cially in the hands of W. Africa's small ...ers. Because these farmers depend ...ly on agriculture for their livelihood ...r their food, shelter, fuel and cash ...me — it follows that agriculture and ...ral community are intimately related. ...r productivity is affected by the ...ices available in the local community ...the distance to fetch water, the ...liness of the water supply, local health ...ces, the ability to read instructions in ...extension booklet, the availability of ...sport to move supplies and produce. ...icultural productivity cannot be ...sured from improvement of the rural ...ronment. Despite this rural ...elopment remains in practice a low ...rity area. There are large numbers of ...ers who never see an extension officer; ...ve no access to credit, seeds, fertilizer; ...ve no guaranteed markets, prices and ...ve no opportunity to realise their poten...



Village processing — keeping wealth and added value in the rural economy.

WEST AFRICAN FARMING

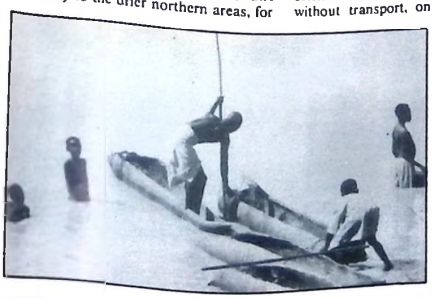
Why is this so and what can be done? There are a number of standard answers and platitudes, but try looking at it through the eyes of the farmer and his family. What will make rural life more attractive, allow them to be more productive and make best use of scarce resources. Only a few points can be mentioned in this short article.

Water is vital

The introduction of a reliable supply of water, whether for drinking or irrigation, has a marked effect on a community. Less time is wasted collecting water and the health of both human and livestock populations is improved. The introduction of a water supply can be expensive if it involves deep boreholes or large dam construction, but in many instances the piping and purification of water can be very cheaply installed. There are improved techniques for rainwater harvesting, relevant particularly to the drier northern areas, for trapping and conserving water from flash floods. But the trend, particularly in irrigation development, has been towards the massive schemes — huge capital investment and major social disruptions. Millions of dollars have been and are being spent on these schemes and it is hard to see how the investment will be recouped. And yet significant yield increases may be achieved at much lower cost from small earth dams used judiciously for supplementary irrigation and for fish farming and even limited amounts of water for out of season irrigation of vegetables, for example, may lead to improved diet and extra cash income.

We need fewer combines and more radios

Education and extension is generally a low priority area. One extension officer often has to service over 2,000 farmers — without transport, on low pay and with limited support. Extension officers frequently receive only a very basic training — for facilities for training and refresher courses are limited and it is difficult to give them good practical training. The extension officer may also find it difficult to work in the rural areas — being at a disadvantage because of his youth, his experience, his training and his lack of support facilities. It is tempting therefore to concentrate the limited resources into a small number of areas. This need not be the case if resources are carefully allocated or best use made of external assistance. It is accepted, for example, that only nationals can be extension officers — in direct contact with the farmer — but much more use could be made of volunteers, for example, in *support* work — maintaining vehicles, preparing radio programmes, even doing the accounts. Again — consider the alternative use of money spent on capital goods — e.g. a combine harvester for large scale mechanised farming. Assuming a cost on farm of $50,000 with maintenance and running costs of 15% ($7,500) this gives a total cost over 5 years of $87,500. For that cost over 2,000 radios (at $30 each) could be purchased and distributed and a man employed to prepare and broadcast agricultural programmes for 5 years. The combine harvester will handle the *harvesting only* of a maximum of 1,000 tonnes of grain. The 2,000 radios could reach 20,000 farmers (2,000 villages) each with 2 hectares of crops = 40,000 hectares. If broadcast advice on planting time and weed control could increase yield from 1 ton/ha. to only 1.1 ton/ha. (10%) — the



Fishing — scope for integration with irrigation.

Continued

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oduce fruits for local and urban con-
sumption — generating cash for the local
economy. (Subject of a separate article).

Increase on farm storage

In most countries throughout the world agricultural produce is stored on the farm. However many West African countries are now developing central stores for strategic reserves to insure against future drought. The motive is not difficult to understand — but in reality the high cost of construction, purchasing, maintaining and distributing stocks is hard to justify, particularly bearing in mind the limited impact such reserves could have. Grain storage capacity of 100,000 tonnes of maize for example would feed 3 million people for about 40 days — assuming the grain was all in good condition. The same effect could be achieved by improving the level of storage at the farm and village level. Traditional methods of storage are at present not the most effective or efficient. However there is substantial room for improvement in storage techniques, rotation of stocks etc. and the small farmer has a vested interest in looking after his stored produce. If the money currently being spent on strategic storage were used to improve "on farm" storage techniques and to pay higher prices in the periods of shortage — it is likely that more grain would be stored and more money would flow into the rural economy.

Farming systems — another neglected area

Agricultural research has traditionally concentrated on specific crops — e.g. cotton, maize, coffee or cassava. In reality, however, no farmer in West Africa grows only one crop. He grows four or five crops, often intercropped, and single crop

Fuel carried on traditional transport.

research results are of limited value. The application of research results requires an understanding of the farmer's system of production and the implications of the proposed techniques not only on one crop but also on the others. The importance of farming systems is now recognised and good work is being done at IITA for example — but much more needs to be done. In Liberia, for example, rice is the staple food and production of rice takes priority. There is no point trying to introduce other crops or techniques without first determining the effect of these crops on rice production at farm level. Recent work in Gambia has shown that the irrigated production of rice requires approximately 290 man days/ha. against 114 man days/ha. for groundnuts. Whilst the net return per hectare is higher for rice, the return per man day is less for rice than for groundnuts. Where labour is short the expansion of rice production or the introduction of double cropping of rice may be difficult to effect. In Sierra Leone groundnuts are grown by women. The expansion of groundnuts may therefore be limited by the amount of time available to women from other domestic responsibilities — as well as competition for land with rice. The introduction of a supply of water into the village may give women several extra hours per day which has obvious implications on groundnut production. Attempts to increase production or introduce new crops must therefore recognise the importance of the farming system.

The limited effect of crash development programmes

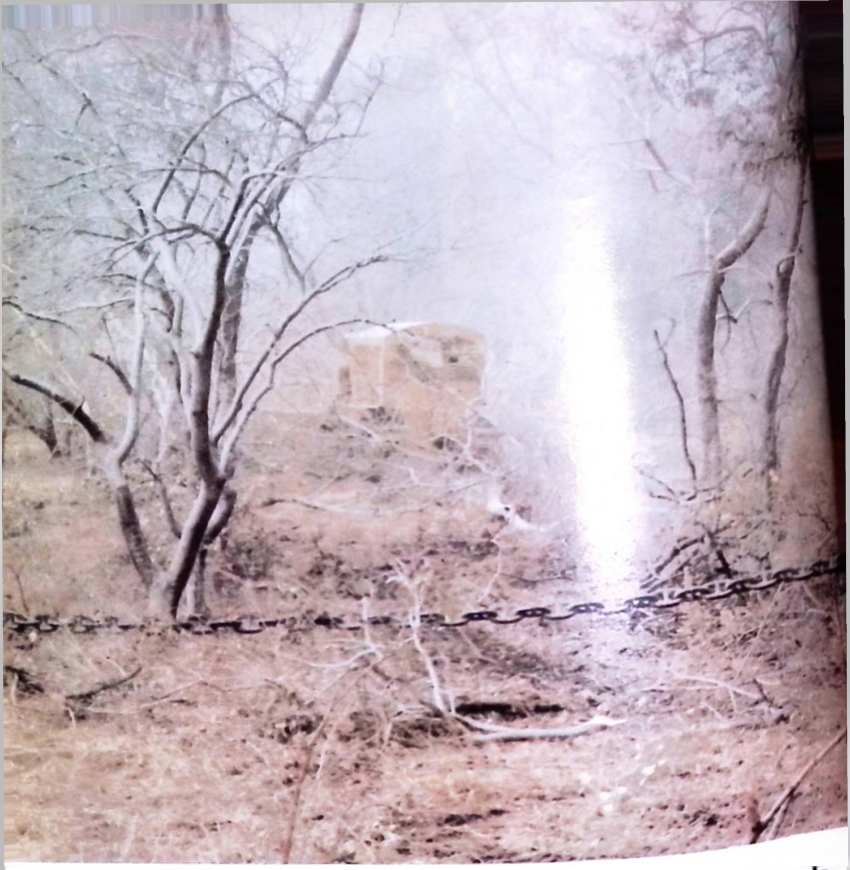
Crash programmes have little value. Realising belatedly the importance of agriculture, most West African governments have instituted some form of crash programme — Nigeria's Operation Feed the Nation and Ghana's Operation Feed Yourself — to name but two. The long term effect of these is generally small. Political speeches reported in the press, tours of the rural areas by senior politicians, a sudden subsidy on fertilizer or increase in the price of rice — these have little effect on the farmer who in many instances will not be aware of them. Much more fundamental changes are needed — security of land tenure, guaranteed prices, credit on reasonable terms, a political recognition of the importance of the rural community, better terms of service for extension workers, improved facilities in the rural areas, improved availability of seeds, fertilizers, pesticides, more opportunities for farmer training, more advice on storage. The effect of any long term effort to improve agricultural productivity will depend on those at the interface between those funding and planning (Government departments) and the farmers — i.e. the extension officer, rural community worker, health care officer etc. These people must be included in the planning process and be given the prestige, support and terms of service they need.

The need for integration of the rural services and the importance of the rural areas is widely appreciated and is incorporated into the integrated rural development projects (IRDP) now being developed in West Africa — particularly with finance from World Bank, EDF and now IFAD. However these IRDP's are expensive and ambitious and limited to a very few areas. Much more needs to be done and can be achieved if the rural areas are given due recognition and resources are sensibly allocated.

The village is the key

In every rural area there is some focal point in the community — which for convenience may be termed the village. It is at this focal point that rural development should start and the village should be involved in the planning and implementation of its own development. There is no standard development programme for each village — although there will undoubtedly by many similar constraints and common answers. There is often no need for vast capital expenditure on buildings, generators, roads and dams. A few simple measures may have a dramatic effect — a small water purification plant, transport for the extension officer, training of farmers in the shade of an acacia tree, regular use of a truck to deliver rice to the nearest market. These are simple measures which make a community feel wanted, accessible to information and markets, involved in its own development — and all for the price of a combine harvester.

These villages are the homes of millions of farmers and their families with decades of experience of their own local environment. These are the neglected millions — in the long term it is these farmers who will feed West Africa. They deserve much more attention. □



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PAG 7

Fleco Tree Pushers–as shown above–fell the entire tree away from the operator. The tree is uprooted so that no stumps have to be removed later. Tree Pushers are also used with crawlers chaining in sub-tropical land clearing to speed up production.

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An aerial view of the Bakolori Dam, still under construction in the Sokota-Rima river basin.

WATER CONSUMPTION
A CAUSE FOR CONCERN

When planning the development of a new settlement, the planner must give considerable thought to the provision of adequate water supplies for the population. In Nigeria, as with many other West African countries, water supply has reached critical proportions. In this article R. Bennett, lecturer in the Dept. of Town Planning and Estate Management, Polytechnic of Ibadan looks closely at the way in which water is consumed throughout Nigeria.

WATER IS a basic element essential to man's survival. Its utilization ranges from personal use for drinking, cooking and personal hygiene, to industrial, commercial and recreational uses. In planning the development of settlements and other physical facilities the planner must give considerable attention to the provision of adequate water supplies for the population.

In Nigeria as in other developing countries the provision of water supply has reached critical proportions both in the urban and the rural areas. This situation is the result of numerous factors which include the rapid population growth, lack of rainfall, and the over utilization of existing supplies, expansion of the physical limits of settlements, lack of adequate storage and distribution facilities and the increase in per capita water consumption which is a result of rapid modernization —in general the disparity between supply and demand.

The urban infrastructure of most of our urban centres includes water supply systems. In most instances these water supply systems were planned prior to Nigeria's economic and development boom of the post independence era. These systems were designed based upon projections from the data available at the time. Possibly the main reason for their inadequacy today is the rapid growth rate which the nation has experienced, which is considerably higher than the rates used for projection ten or fifteen years ago. Hence there is a rapidly growing short fall between available water supply and the present demand for water.

In the northern parts of Nigeria this problem has been increased by the recent drought. In addition to the general increase in water consumption resulting from population growth there has been a drastic reduction in the avail sources which depend large annual rains.

Reliable projections essentia

In planning for an adequate ply system the planner must e existing consumption rate an able projections of future us cess requires two basic sets o there should be adequate pop available, and second per sumption rates should be kn

The first data requirement problem, as in Nigeria the las census was conducted mo decade ago in 1963. In the ab data, it is the planner's resp establish some basis upon wh tion estimates can be

...ntinued

...ated previous experiences in project-...water demands over various time ...es, the planner would be well ...ised to avoid conservatism in estima-...n, particularly in considering urban ...as.

The second item of data necessary for ...e calculation of the demand for water is ...e average per capita consumption rate. ...s stated in the Nigeria's Third National ...velopment Plan the National per ...pita consumption goal for 1980 is 114 ...tres per capita per day. In considering ...is figure however, the planner must ...ise that this is a short range ...e year ...al.

Understanding per capita consumption

In order to have a mo... thorough ...derstanding of the per cap... consump-...mate the planner must lo... the var-...us factors which influenc... ater con-...sumption. Nigeria has set ... urban per ...apita consumption goal of ... ped while ...developed countries toda... e range of ...water consumption per per... per day is ...the neighbourhood of 500 ... 1,000 litres ...per capita per day. In some communities ...the industrialised nations the consump-...tion rate has even exceeded 2,000 iped. ...To project Nigeria's long term water ...requirements, therefore, it is necessary to ...examine water consumption trends.

Most essentially water is used for drinking. This can be either in the pure form of drinking water, it can be processed water as in beer and soft drinks or it can be mixed water as in the instance of beverages (which in this instance includes fruit drinks). Water consumption by drinking will depend on environmental conditions. In hot-dry areas the potential for consumption is normally higher than in hot-humid areas, also liquid consumption will generally be directly proportional to the temperature and inversely proportional to the humidity. This is due to the body's biological requirement for water input.

Type of consumption

The form (pure, processed, mixed) in which water is consumed is also important to the planner. When there are areas where the consumption of processed water is high, it means that the industrial districts producing those processed drinks will have higher demand for water.

In upper income areas the consumption of processed water is prone to be higher than in lower income neighbourhoods. This may possibly decrease the individual's consumption of pure water for drinking purposes. Low income neighbourhoods on the other hand are more prone to consume more tap water for drinking either as pure water or mixed water.

Water is also used for cooking. Consumption for this use is largely influenced by culinary preferences and economics. In comparison with Western Countries where many of the foods are boiled or otherwise prepared with water, Nigeria's per capita water consumption rate for cooking is fairly low. On the other hand however, due to the relatively large family size the bulk consumption for cooking may not be as low as anticipated.

Water demand for sanitary use

Water has a hygienic function, and perhaps here is where a large difference in consumption rates is most clearly visible. Washing the body, for example, requires about 10-15 litres for a bucket shower, 20 litres for an overhead shower, and as much as 125 litres to fill a bath tub. Consequently the utilization of overhead showers and baths can drastically increase water demand. At present washing in Nigeria is normally the bucket bathing system, but as showers and baths are now becoming standard fixtures in dwelling units it can be anticipated that the water demand for personal hygiene will drastically increase as the population is provided with these sanitary fixtures.

The demand for water for sanitary use is also rapidly increasing. The outmoded systems of night soil disposal, pit latrines and deficating "in the bush" are rapidly giving way to the water borne sanitary

Continued

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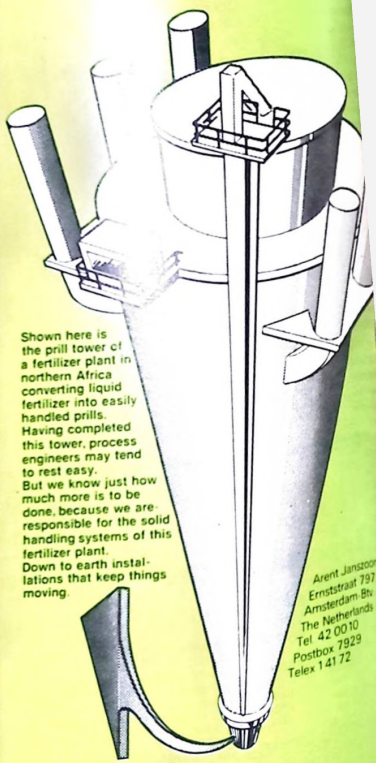

Shown here is the prill tower of a fertilizer plant in northern Africa converting liquid fertilizer into easily handled prills. Having completed this tower, process engineers may tend to rest easy. But we know just how much more is to be done, because we are responsible for the solid handling systems of this fertilizer plant. Down to earth installations that keep things moving.

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... The water borne system requires ...imum of 10 litres of water for flush- ...ranted the present water shortages, ... people using the water closet toilet ... normally refrain from flushing ... each use. This in itself is not a very ...nic practice as the system was not ...ned to hold wastes for prolonged ...ods. It has however become a realis- ...ecessity based upon the limited sup- ...of water and not the actual demand. ...As the water supply is increased the ...erborne sanitary system will receive ...ter utility. It will not only be ...shed, ... consuming 10 litres of wa... after ...bowel movement or urinat... but it ... in the future become an ...ct of ... general garbage disposal ...tem. ...n it will be used, and flushe... the ...osal of light matters such ... tissue ...per, ashes and cigarette butts ... even ...nic wastes such as foods. ... need- ...to say will serve to increase ... water ...mand.

Tiga earth dam development, an attempt to meet demand.

ncreasing demand

As the national attains a greater level of affluence the demand for water will increase. Water will be required for lawns (at about the irrigation rate of 8-30 litres/ha), recreational facilities (swimming pools and showers for other athletic activities). There will also be increased demand from the industrial sector as well as the commercial sector (restaurants, drinking parlours, toilets in offices, etc.) not to mention those water consuming household appliances such as clothes washers and dish washers.

In addition, experience has shown that as water becomes consistently available the propensity for waste increases. Hence, when running water is assured an individual will be prone to brush his teeth by running the tap thus consuming 2 litres of water instead of the one cup that he formerly consumed. When washing dishes the housewife may, with the regular supply of water, be tempted to wash the dishes under running water. The toilet may be flushed — consuming 10 litres of water — to extinguish and dispose of one cigarette.

The water consumption goal for 1980 as stated in the 3rd National Development Plan is 114 lpcd. This is the Government's goal for urban centres in excess of 20,000 population. Naturally for areas with large concentrations of Industrial or Commercial consumption the per capita consumption rate will be higher.

The following table (condensed from "Physical Targets of Major Urban Water Supply Projects" of the Third National Development Plan) gives per capita consumption rates and projections for selected Nigerian urban centres. The table illustrates that of the 12 selected urban centres three may possible fail to achieve the National consumption goal of 114 lpcd. The reasons for this are multiple, but it can be assumed that finances and natural conditions (i.e. the location of the water source) are influencing factors. The other factor may be that of priorities. In some of the states the Government has placed high priority on rural water supply. This is usually at the expense of the urban areas, but it falls in line with the government's efforts to reduce rural-urban migration by the provision of amenities in the rural areas.

The table also shows that at least two of the selected urban centres will have consumption capacities far in excess of the National Goal. In the instance of Jos, which had one of the lowest consumption rates in 1972, a massive water scheme is now under way. This scheme will provide the metropolitan area with a 1980 consumption capacity comparable to that of some European Urban Centres. At a consistent annual population growth rate of 10% the proposed Jos water supply will be able to provide for an approximate daily consumption rate of 201 lpcd in 1990 and 134 lpcd in 1995.

Town	1972, litres Per capita per day Consumption Rate	1980 Consumption Rate Projection lpcd
Benin	34	145
Calabar	27	98
Enugu	82	159
Ibadan	123	84
Ilorin	45	155
Jos	227	452
Kaduna	75	155
Kano	75	123
Lagos	32	100
Maiduguri	150	176
Port Harcourt	82	148
Sokoto		

Condensed from "Physical Targets of Major Urban Water Supply projects" of the Third National Development Plan.

Consumption rate for Jos and Kaduna

Jos is also fortunate because the present water scheme under construction is the first major scheme for the area. Jos also has an extreme geographical advantage which allows for convenient damming and gravity flow.

The 1980 consumption rate for Kaduna appears high, but in 1972 Kaduna had the highest per capita consumption capabilities than any of the then state capitals. The increase in consumption therefore represents an increase in consumption potential of 55% which is below the average of the selected areas.

The consumption figure put forth in the 3rd National Development Plan is a short range goal. The planner should always be mindful of this fact and should look past this figure to the future long range water requirements.

At the beginning of the twentieth century some Western Countries were consuming approximately 60 litres of water per capita per day. Seven decades later this rate of consumption has doubled in some areas and increased almost four fold in others. In programming the future water demands for a rapidly developing Nigeria the planner must develop a knowledgeable familiarity with the consumption patterns of the public and combine that knowledge with reasonable population forecasting techniques to accurately project the future requirements for this essential utility. □

West African CONSTRUCTION

Magazine within a Magazine

September 1978

In this issue:

10... Dumper 2032kg (2 ton) pay-load

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Construction News

Transporting liquid — A new approach

A quick and convenient solution to the problems of transportation and storage of liquids in civil engineering has been developed and vigorously tested by the GRG Division of Dunlop. The containers, which are collapsible, are available in a range of sizes from 230 to 230,000 litres according to specific customer requirements. The containers are harnessed to the back of trailer trucks and so avoid recourse to specially designed tankers or permanent steel or concrete tanks. However, load reaction using this method is of vital importance. The containers must not be over-filled and harnessing must be correctly adjusted to compensate for the surge of liquid being carried.

Concrete mixed like food

A leading company in food mixing technology E. T. Oakes (a member of the Mono Group) met a challenge to see if food mixing methods could be used for the mixing and production of lightweight aerated concrete.

The results of the challenge was that its Buildersmate Cretolite Unit devised an efficient way of producing up to 7 cubic metres per hour of lightweight aerated concrete in a continuous or semi-continuous process. An integral pump enables the unit to deliver the finished product to the point of use at heights of up to 30 metres for on-site use the machine is supplied as a trailer-mounted unit for towing by Land Rover or similar vehicle with power supplied by a diesel engine rated at 16 hp. It is also available as a static installation for use in low cost housing projects.

Production of prefabricated houses and wharfs to start

The Nigerian company Poco Minerals Ltd. is soon to start production of prefabricated houses at Aniocha in Bendel State.

This project represents an investment of ₦2m and the overseas technical partner is the Brazilian company, Petrobras Comercio International SA. The initial production capacity will be six three-room houses a day.

Poco Minerals is also associated with the American company Leslie & Elliot who builds prefabricated wharfs in units 50m long. The first complete wharf is being assembled in Port Harcourt for the Nigerian Ports Authority.

Cement outlook optimistic

Out of the 3.6m. tonnes of cement used annually in Nigeria only 1.3m. are locally manufactured says the Managing Director of West African Portland Cement Co. However he predicted that there would be a sharp rise in production by 1981.

- Ex-factory prices for cement produced in Nigeria have been increased by approximately 50 kobo a bag.

New State Buildings

All state governments in Nigeria have been directed to start preparation for legislature for the construction of ministerial houses and houses for governors in preparation for the 1979 return to civilian rule. The **New Nigerian** quoted sources as saying that the FMG's directive also stipulated that each state government should complete the buildings before the military hands over power and that the Federal Ministry of Works has despatched architectural designs for each category of building in the states. The report also added that 75 per cent of the costs were being financed by the FMG and the rest by the states.

Contract news...

The Imo State Government has awarded a contract worth more than ₦35m for the construction of roads in Aba Town. The contract has been won by **Monier Construction Company (MCC).**

A ₦6.9m contract has been awarded to the **Kano State Water Resources and Engineering Construction Agency** by the **Niger State Government** for the construction of a water project at Tagwai Dam near Minna.

An Irish company **Honeycomb Industries** has won a £1.2 (₦1.4m.) contract to build and equip an integrated soft drink plant in Nigeria. The plant is for **Northco Construction** who are diversifying into the soft drink business. Honeycomb Industries also has a separate contract to supply raw materials and to manage the plant for three years.

The French consultancy group **SOFRELEC** has been awarded the contract for carrying out studies for the construction of a hydro-electric dam on the river Mano. **The European Development Fund** is providing a grant of $3m to finance the study. The dam is part of a regional project involving Sierra Leone and Liberia.

Taysec Construction Ltd., a Ghanaian company in the Taylor Woodrow Group has been awarded a contract worth £830,000 for the foundations and superstructure of a grinding mill at the **Ghana Cement Works,** Tema. Construction is scheduled to take 11 months and consists partially of structural steel and partially reinforced concrete frames.

P. W. Nigeria an associate company of the Irish based **Public Work Ltd.** has won a contract worth more than ₦10.6m. to upgrade the Minna-Paiko-Izom F216 highway into a dual carriageway and secondary road. The work is expected to take a year.

Arrangements for construction of a N10m. parliament building at Minna, capital of Niger State have almost been completed. the design has been undertaken by the West German firm **SIAB (Nig) Ltd.**

Part of a consignment of **Wabco** 25 and 35 ton dump trucks supplied by **Acim division of Bewac** on their way to the Shiroro dam project. the order was placed by **Torno** who are handling the dam project.

Please note that in our article on hydraulic excavators in the August issue, page 83 bottom of col. 1 should have read:—

$$\frac{K}{P + V} = X\%$$

Page 83 col. 2, line 14:—

$$\frac{K}{P + V}$$

Page 86, fig 2, bottom caption "RTF = 3.3"; page 87 line 48 "1.5 to 3.0 m/h (2.4 to 4.8 Km/h); and page 87 col. 3, line 4 "24.8 Km/h (16.8 m/h) and 17 to 20 Km/h (10.6 to 12.5 m/h).

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WT 33800kg (74,510 lb)

● **D150A**
FH 300HP
WT 33800kg (74,510 lb)

● **D85A**
FH 180HP
WT 22230kg (48,570 lb)

● **D85E**
FH 180HP
WT 23140kg

● **D80A**
FH 180HP
WT 21930kg (48,

● **D80E**
FH 180HP
WT 22840kg (50

● **D65A**
FH 140HP
WT 15730kg (3

● **D65E**
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WT 16410kg (

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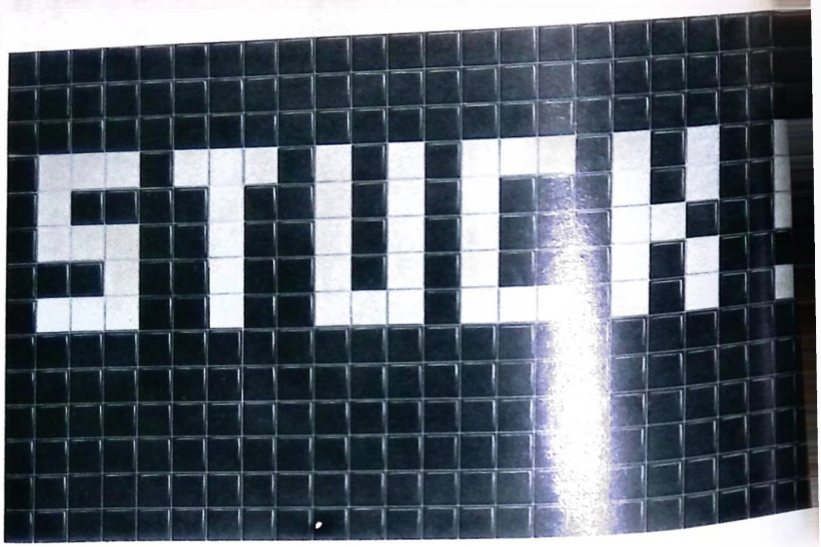

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Ghana. Shell Ghana Limited, P.O. Box 1097, Accra.

Ivory Coast. Shell Côte d'Ivoire, B.P. 20847, Abidjan.

Liberia. Petro Chemical Industries Inc. P.O. Box 464, Monrovia.

Nigeria. National Oil & Chemical Marketing Co. Ltd., Private Mail Bag 2052, Lagos.

Senegal. Iransen et Shell, P.O. Box 144, Dakar.

Sierra Leone. Shell Sierra Leone Ltd., P.O. Box 66, Freetown.

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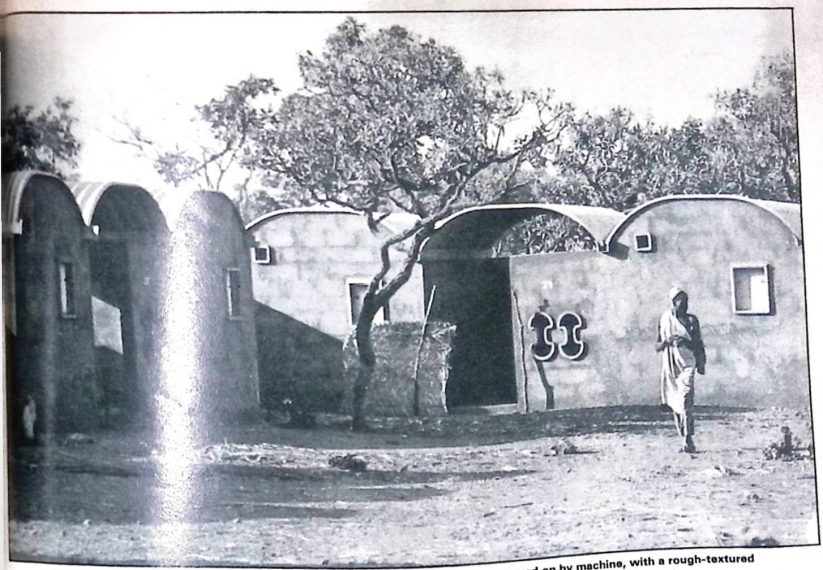


"... the walls were waterproofed by a coloured cement-and-sand render, sprayed on by machine, with a rough-textured finish" New housing at Kainji *(Acknowledgement: architect and photographer: Robin Atkinson).*

BUILDING WITH BLOCKS

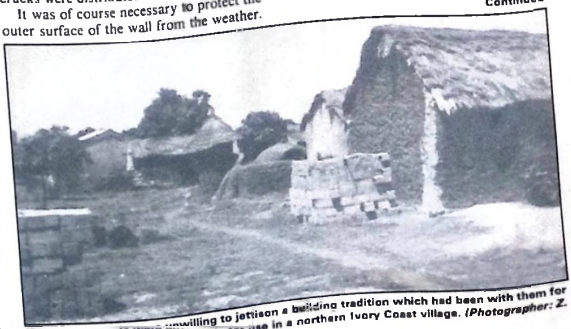
In this second article on Bricks and Blocks, Noel Moffett compares the traditional block in architecture, with the varied structural and facing uses of the more technically advanced block today.

"THE ARCHITECTURE grew much like a plant, conditioned by the readily available raw materials . . . Traditional architecture has a high suitability for tropical habitation, the insulating thatch roof and mud wall provide an enviable protection from the menace of tropical sunshine and heat, making artificial air-conditioning unnecessary."

Chinedum Ekeh, an architecture student at the University of Nigeria at Enugu, was describing Igbo architecture. His description could be applied equally well to centuries of building in many African countries. Mr Ekeh went on to describe how the walls were built: "The major walling material is the tough brown earth which is dried, watered and kneaded, then rolled into lumps ready for site work." These lumps or balls were built up into layers each about 450 centimetres deep to form a wall usually about 250 centimetres thick. Each layer was left to dry and consolidate for about two weeks before another layer was added, so that shrinkage cracks were distributed throughout the wall.

It was of course necessary to protect the outer surface of the wall from the weather. In Nigeria this was usually done by applying two coats of wet clay: the first one well rammed and consolidated, to close the gaps

Continued



"Yet many people were unwilling to jettison a building tradition which had been with them for so long", Swiahcrete blocks ready for use in a northern Ivory Coast village. *(Photographer: Z. Tebbit).*

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...e layers; the second applied with ...t shell, used as a trowel and ... smooth, with a banana stem. The ... of a chief's palace were generally ... and rubbed down every morning, ... to maintain their smoothness. A ... traveller, writing in 1668, records ...ration thus: "The walls were made ..., very well erected, and they can ... and keep them as shiny and smooth ...ashing and rubbing as any wall in ...rd can be made with chalk, and they ...like mirrors." A Scottish travelle... wrote ...39 that "the walls (were) ... well ...ted that they had the appea...ce of ...varnished." Sometimes the ...ls of ...ate rooms were plastered ...nally ... a mixture of mud and cow ...ag or ... and graphite, to repel ce... ...aches ...d other insects and to help to ...e the ...ld damp-proof. In the Ashan... rea of ...ma external rendering techni... ...s were ...mar but more dramatic ... more ...ourful, a dark colour being u... for the ...er part of the wall, with wh... yellow, ...n, blue or green above.

Unhappily there were major ...nges to ...e traditional building me...ds. Mr. ...ich summarises them like this:

"However, the nature of mat...rials limits very strongly the size of the building. It is open to destruction by termites and other ants and cockroaches ... To scare these pests fire must be made in the house. This increases the cases of fire hazards in such a bundle of combustible materials. The roof covering has to be checked annually to remove and and replace damaged members. The walls and floors must be scrubbed from time to time."

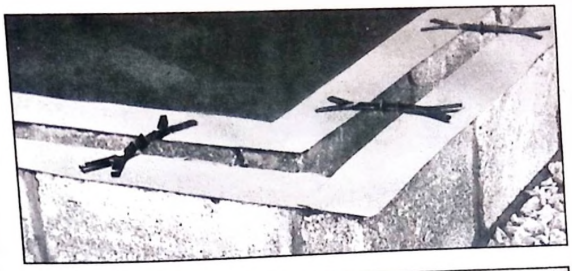
Many attempts have been made to overcome these traditional problems. In Paul Oliver's fascinating book SHELTER IN AFRICA Andrew Rutter describes what is being done in the Ashanti rural areas.

"Better quality houses are built with concrete strip foundations, sand/cement or laterite and cement blocks, concrete lintels and ring beams at the eaves. Door and window frames would also be built in as the work proceeds. These houses are usually built by individual masons and carpenters organised by the building owner rather than a building contractor. As a result, blocks would be made on site in simple moulds by hand, rather than by machine. Attempts to introduce simple block-making machines and concrete mixers by the Department of Social Welfare and Community Development have not caught on in house building because of the need for continuing operation by a small team of semi-skilled men. The organisation of this is sometimes beyond the reach of the normal house owner, who has his routine business to attend to."

The great debate

As people moved from rural areas into the cities, all over Africa, and as the demand grew for higher standards of accommodation and more suitable building techniques, dissatisfaction with the old methods became evident. Yet many people were unwilling to jettison a building tradition which had been with them for so long. The great housing debate, which had begun in the colonial era, continued throughout the 1950s and 60s and is still with us.

The twin questions which have not yet been satisfactorily answered are these: Should we build houses of an improved traditional type which families living in a tribal society have been accustomed to? Or should we build non-traditional houses of an unfamiliar kind but catering for the needs of a modern society? In attempting to answer these questions houses and housing schemes have been built in West Africa which illustrate both philosophies. I have chosen one example of each, by way of illustration.



"... blocks would be made on site, in simple moulds by hand, rather than by machine".

Tema

When Ghana decided to build a new port at Tema the master plan included large areas of low-cost housing. The Overseas Building Note on the plan philosophised in this way:

"It is a natural effect that, as urbanisation takes place, tribal ties and disciplines must be superseded by other loyalties if a co-ordinated, law-abiding new African society is to emerge. It is important that the town dweller be endowed with a keen sense of community membership to counteract and replace more primitive or even feudal associations that are inclined to hinder a progressive movement of amelioration and change ... This type of policy and a minor African revolution within the established social pattern needs a non-traditional type of housing construction, and tribal compound have no place."

This philosophy led to the building of straight, parallel housing roads lined with rows of identical, neat, pleasant little suburban houses, with prefabricated, mass-produced walls and roofs, brought to Ghana from British factories and speedily erected on site. The houses were popular enough with many of the British and European technicians and their families, but they were disliked by the Ghanaians and unacceptable to them, as they had none of the qualities which they found in their own villages — subtlety of layout, functional suitability, sense of community and environmental sensitivity.

Kainji

The building of the huge hydro-electric dam and lake on the river Niger in 1969 meant that the riverine farming communities lost their homes. The formidable task of rehousing 42,000 people living in 192 settlements in towns, villages and hamlets was given to Robin Atkinson of the Lagos firm of Fry Drew Atkinson. His brief was short and challenging:

"The population is to be rehoused at minimum cost. The housing and the environment must be acceptable to the people of the area so that they will move

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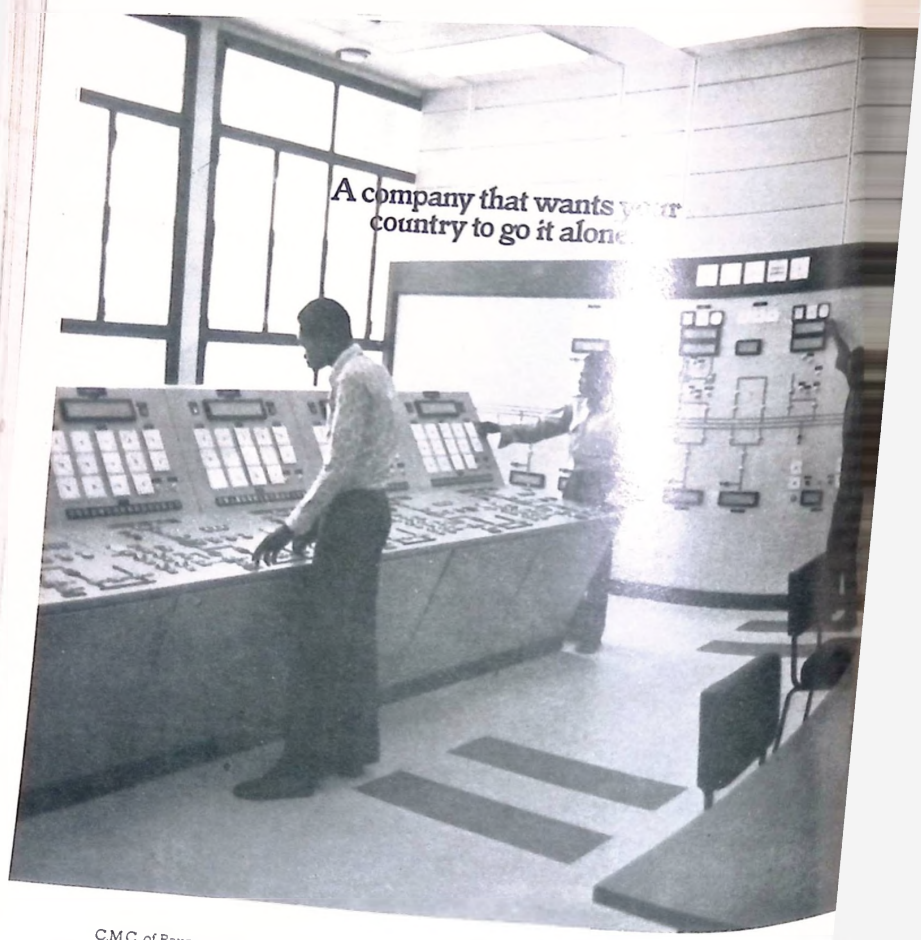

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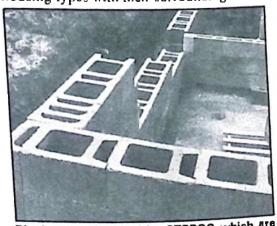
ngly to their new accommodation
out coercion and with the minimum
ress. Replacement is to be the over-
ing factor, not development."

architect responded with a com-
ble mixture of realism and imagina-
He carried out an aerial survey of
, village and town; an intensive
d level study of the existing forms,
s and densities of the urban and rural
unities; and a social survey to
sh why a particular group had
ped its settlement in a particular way
identify by observation the way of
and controlling factors of influence,
ers and mutual understanding each
mmunity.

WEST AFRICAN CONSTRUCTION

These studies revealed that expansion of communities was at first internal and later peripheral. As there could be no planning control on completion of the project, it was decided to maintain existing densities and housing patterns (which the architect calls 'shadow patterns') so that each community would, hopefully, adjusted easily to its new houses through recognising familiar colour-ings, shadow patterns, forms, planning arrangement and density. For simplicity the shadow patterns and plan forms were divided into four basic types of settlement: urban, semi-urban, semi-rural and rural; and each of the 121 new communities had its own individual plan related to the ethnic group being rehoused, to its present stage of development and to the topography of the new site chosen by the villagers.

The new dwellings have 230 mm. sand-crete (sometimes called 'swishcrete') block walls, with a curved, self-supporting, asbestos-cement roof. All blocks were made on the site and the walls were water-proofed by a coloured cement-and-sand and render, sprayed on by machine, with a rough-textured finish. All walls have the same laterite-coloured rendering which has the effect of unifying the many different housing types with their surroundings



Blocks manufactured by STEPOC which are lightweight, aerated, hollow and cellular.

It is interesting that this imaginative design approach was accepted by most of the people affected — the architect claims a 95% acceptance. When the first group of west-bank villages was inspected by its future tenants the building materials and finishes were generally approved and a decision was taken that the rumbus (granaries) and other small buildings would be built by the inhabitants themselves, in positions to suit them; but, because of the need for speed, all the houses were built by local contractors.

Nsukka

Kainji's new village and towns are a successful attempt to reinterpret West Africa's traditional building methods in terms of today. Their success was very largely due to the imaginative and sensitive design approach of the architect. Happily other architects too are trying to do the same thing. One of the most interesting attempts so far was at Nsukka.

In 1957 James Cubitt & Partners were commissioned to prepare sketch plans for a new university at Nsukka. There were to be 3,000 students, about a quarter of them women. Included in the plans was low-cost residential accommodation for men and women students. As the soil on the site was very suitable for making high-pressure building blocks the student accommodation was designed to be built of these blocks, treated externally with a waterproof silicone solution. Each student's dwelling was designed to give through ventilation and a reasonable degree of privacy. Thirty-two residences formed a group, each one with WC and shower and a common room, and seven of these groups formed a residential college.

Continued

…d that these interesting and …ly practical ideas for providing …t residential accommodation were …nceived and nothing was actually

…von cob

Most countries, I suppose, have used …e a walling material at some time in …architectural history. England was no …wn and mud buildings can still be …n Cambridgeshire, Norfolk, Suffolk, …set and Cornwall. In Devon … shaly …which was called shillet), wi… mixed … straw and animal du… was …icularly suitable for buildin… It was …ked and allowed to dry in … …rs, not …like the West African traditio… …eather …protection was provided by co… of lime …ash, tarring at ground level a… …n over-…hanging roof.

Mud wall building has laste… …nger in …Devon than elsewhere in Britai… …d today, …because of the high cost of l… …ding and …transport and the present att… …on being …given to energy conservation. …evival of …this walling has started and is l…ely to con-…tinue – certainly for single-s…orey build-…ings of a simple design.

WEST AFRICAN CONSTRUCTION

Last year Devon's county architect built a small, experimental storage building to see if it was possible to combine up-to-date technology with the use of local materials The main features of his experiment are:

a) The qualities of glass-fibre reinforced cement as a structural and weatherproof coating, allowing low-grade material to be used for the core of the wall; material which can be excavated from the site.

b) The need for a suitable technique for simple construction, on occasions when labour is more readily available than finance, e.g. parent teachers and self-help schemes.

c) The substitution of a low-energy wall for single-skin walls of brick or blockwork, bonded and laid with mortar jointing which require significant amounts of energy in the manufacture of materials and which have a poor thermal performance.

d) The means to use local materials for the bulk of the building, with a consequent saving in the fuel and monetary costs of transport.

e) For many single-storey buildings the stress on a wall is not severe and a relatively simple mass wall will be sufficient.

f) A dense and thick wall will act as a heat sink and the effect of external daily extremes of temperature will be much reduced internally, giving greater comfort. The use of perforated blockwork will give additional insulation value to the wall, thus reducing the heat loss or gain.

Devon's experimental building has aroused considerable interest in the building industry in Britain and will no doubt be followed by others in different parts of the country. The two main lessons learned are the same ones which generations of amateur builders the world over have learned the hard way: 'Considerable care has to be taken to avoid getting the block wet, as it readily returns to malleable clay if allowed to absorb water' (in West Africa block walls were always built well before the rainy season began); and external rendering has to be completely waterproof.

Modern blocks

Ten years ago George Perkin, architect editor of CONCRETE QUARTERLY wrote:

"Architecturally, the possibilities of the concrete block have still to be more fully exploited — in this country, at any rate, although in countries such as the United States and Finland it has for some time been part of the general scene. The reasons for our reluctance to make the most of this sound, convenient, versatile and relatively cheap building unit are difficult to understand."

Today Mr. Perkin must be pleased that this is no longer true. As building costs have risen steadily and facing bricks became dearer steadily, architects have specified concrete blocks as walling material more and more frequently.

Today the choice of block, for structural or facing use, is wide, ranging in texture from the smooth and polished to the rough and rugged and in colour from white, through many tones of grey, to black; one can get plain blocks, profiled blocks, exposed aggregate blocks; dense blocks and light-weight blocks; solid, aerated, hollow and cellular. Most of the light weight blocks give excellent thermal insulation. Standard sizes are usually 460 by 230 mm., with a thickness of 75, 100, 150 or 220 mm. There are many different kinds of block-making machine on the market and some of the simpler, cheaper ones are gradually coming into general use.

WEST AFRICAN CONSTRUCTION

Problem

Architects seem to find that concrete block walling presents only one major problem: in large unbroken areas of walling continuous control joints are necessary, to prevent cracking caused by the inherent shrinking tendency of blocks. The solution is either to locate the joint satisfactorily from the practical and the aesthetic points of view, or to design the walls of the building so as to avoid the necessity for such joints.

Paradox

And so we have a curious paradox. The technique of building with blocks has advanced — as the centuries have come and gone — in two directions: in one, people build the walls of their houses today, as they have been doing for a very long time, with blocks made from the clay of the site itself, but probably using a more labour-saving technique than heretofore in the other, buildings of considerable sophistication and elegance are possible with walls built from one of many different kinds of concrete block and a finish from a wide choice.

Happily the huge world of building welcomes both advances and both must be used if the gigantic and urgent problem of building decent homes for people to live in, at a cost they can afford, is ever to be solved. □

"Buildings of considerable sophistication and elegance are possible". Office building at Llandaff, Wales. *(Architects Holder & Matthias Partnership. Photographer: T. Soames).*

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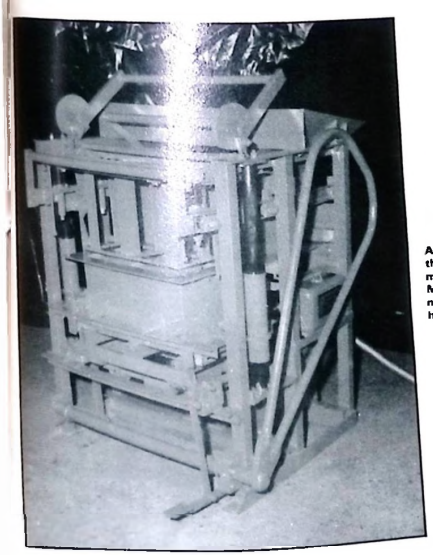
Modern building techniques now being used in the developing countries mean that concrete blocks are being used to an ever-increasing degree, both in a load-bearing and cladding role. Although it would seem at first that for a reasonably large project a high output machine should be used, careful consideration should first be given to the skills of the labour force, the equipment being used to load the machine and remove the finished blocks, the type of aggregate being used, and the amount of room on the job site for storage of the blocks. In addition to the choice of manual or automatic machine, site conditions will usually dictate whether to use the type which manufacture the blocks on a pallet or directly onto a concrete apron.

CONCRETE BLOCKMAKING



A popular model in the West African markets is this Lee Magnum HB3; the model shown here has diesel vibration.

CONCRETE MASONARY units are designed and manufactured for a wide range of uses in construction. They fall basically into five different types: hollow load-bearing concrete block; solid load-bearing concrete block; hollow non-load-bearing concrete block; concrete building tile; and concrete brick. They are made from either heavyweight or lightweight aggregates and are thus known as heavyweight and lightweight units respectively. Heavyweight units are made with such aggregates as sand, gravel, crushed stone and air-cooled slag. Lightweight units are made with coal cinders, expanded shale, clay or slag, and natural lightweight materials such as volcanic cinders, pumice and scoria. The choice of units naturally depends upon their structural function and their availability.

The American Society for Testing Materials defines a solid concrete block as a unit in which the core area is not more than 25 per cent of the gross cross-sectional area. A hollow concrete block is a unit having a core area greater than 25 per cent of its gross cross-sectional area. Generally, the core area of hollow units will be from 40 to 50 per cent of the gross area.

The American standards applied to concrete blockmaking are high, as it is a country which has been using them for load-bearing construction for a good many years, and where there is a wide range of atmospheric and temperature conditions to be encountered. The American Society for Testing Materials publishes a list of specifications covering requirements such as compressive strength, absorption and moisture content.

Compressive strength requirements provide a measure of concrete masonry's capacity to carry loads and withstand structural stresses with an adequate factor of safety. The absorption requirements provide a measure of the density of the concrete. The moisture content requirements are intended to indicate whether the unit is sufficiently dry for use in wall construction. Concrete, in common with a number of building materials, shrinks slightly with the loss of moisture as it achieves an air-dry condition. When moist units are placed in a wall and this natural shrinkage is restrained, tensile and shearing stresses are developed which can cause cracks to appear in the walls. It is therefore important that architects and builders ensure units are dried to at least the moisture content limitations of applicable specifications.

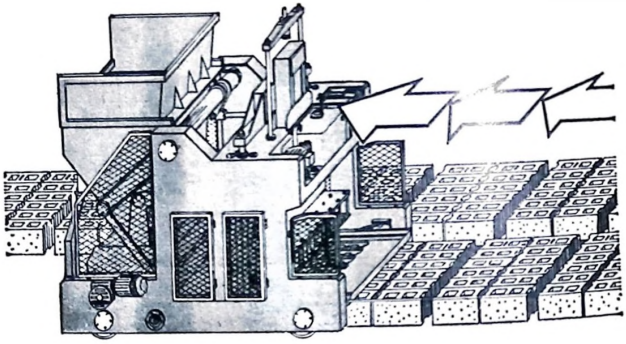
Where concrete masonry walls will be exposed to low relative humidities, such as may be found in the interiors of heated buildings, or areas with exceptionally dry climates, the block, at the time of laying, should be dried down to approximately the average air-dry condition to which the finished walls will be exposed in service. This can be achieved with an oil or gas burning heater and blower. The blocks are stacked on their sides and the warm air blown through their cores. Concrete masonry units stored on site should always be protected against wetting.

Machinery for concrete block manufacture

The concrete block may never replace the traditional clay brick for all construction work, but it accounts for a significant and growing percentage of the building materials market throughout the world. The production of concrete blocks is now highly mechanised and outputs of 3,000 blocks per hour from a single machine are common.

Continued

The machine that lays the golden eggs



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The Rosacometta model 120 A/S duplex drawn above can render an hourly output of up to 1,700 blocks operating on 4,000 square metres of runway.

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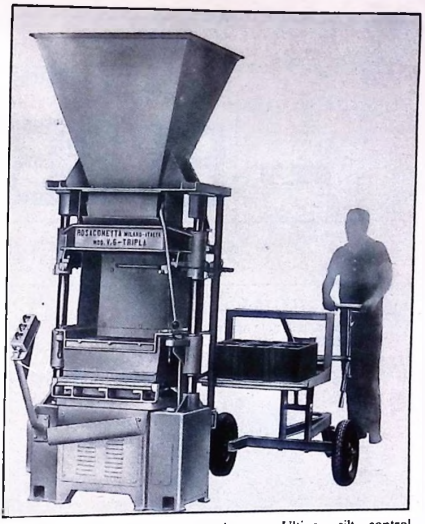
...making machines follow a fairly ...d basic design. Concrete is poured ...hopper on top of the machine and is ...metered quantities to a row of mould ...below. The boxes are bottomless and ...the concrete floor of the moulding ...During the pouring operation. The ...concrete is then vibrated to con... it and the mould boxes are lifted ...new blocks. The machine moves to ...next pouring position, the mould boxes ...lowered to the floor and the next row of ...is cast.



The Rossocometta Model V6-Triple blockmaking machine distributed by M & E (Division of UAC).

WEST AFRICAN CONSTRUCTION

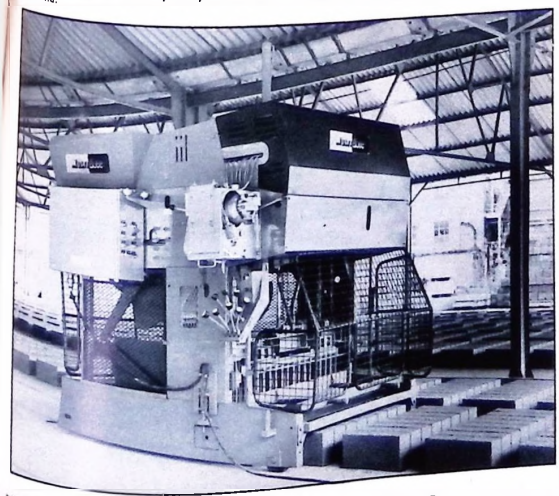
...One of the leading UK manufa...ers of ...blockmaking machinery is ...elding ...dustries Ltd., of the UK. As a ...t of its ...derable experience in the ...ld, the ...mpany now uses hydraulics ...asively, ...at a working pressure of 10...r (1,500 ...in²). The benefits of good fil...on were ...ognised long ago, and for ...me time ...Pall 9600 'Ulitpor' pressu...ters with ...micrometre nominal (25 ...crometre ...solute) ratings have bee...used on ...lding Industries machines.

When the company decided to produce ...e Multibloc Automajor, a completely ...comated blockmaking machine, the main ...blem to be overcome was ensuring that ...e machine would move in a straight line. ...is is essential to facilitate mechanised ...moval of the cured blocks and for ...ximum utilisation of the floor area. ...Guide rails are not practicable and ...electronic guidance systems are too ...sophisticated for this type of application; ...blockmaking machines have to be kept ...simple and rugged.

The solution adopted is both simple and effective. A wire 'feeler' senses the previous rows of blocks and its movements actuate a Dowty servo valve controlling the hydraulic steering cylinder. Therefore, if the first row of blocks is straight, all the subsequent rows will be straight. Previously, the operator corrected run-out by stopping the machine periodically and slewing it over, using a built-in jacking system. The new method provides continuous correction and the production of blocks is not interrupted.

Incorporating a servo valve in a hydraulic system increases the need for effective filtration. The Automajor still uses a Pall Ultipor 9600 pressure filter, but it now contains an Ultipor silt control element with a 0.45 micrometre nominal (3 micrometre absolute) filtration rating.

The "Automayor", manufactured by Welding Industries Ltd., is a completely automatic machine.



Small capacity machines popular in West Africa

West Africa is a region that tends to use a lot of small capacity machines, particularly away from the city centres; these are usually powered by generator sets. For higher outputs the big machines are necessary and these are usually run off the mains supply, although they can and do use power from generator sets. For rapid production, Welding Industries claims its Multibloc range can be operated by almost any kind of labour under almost any conditions. The art of rapid block production lies in dispensing the correct proportions of aggregates and cement, mixing to a consistent standard, delivering to the block machine, making the blocks and then stacking and moving them out of the factory quickly to make room for more. It is a production flow-line principle that relies on the efficiency of its com-

Continued

For concrete brick cubing Columbia's Model BRK is compact and simple to use.

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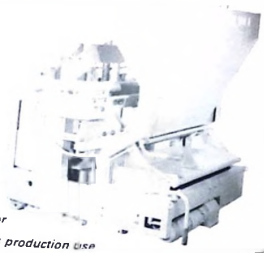

Suitable for continuous production use

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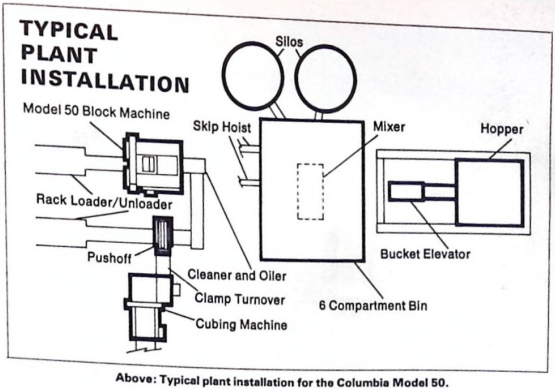
parts. Multibloc offers a range of machines to meet high or low designed in each case to keep the force to a minimum. In addition to right machine for the job, Multibloc a complete blockyard system, to meet individual requirements.

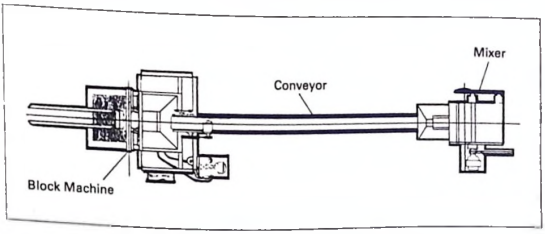
One of the major Canadian companies in this field is Columbia Machine of Vancouver. The company has just introduced the new Model 50, which it claims offers the highest production rate in the industry today. The machine is a heavy, rugged blockmaker which produces standard 200.2 mm (8 inch) x 203.2 mm (8 inch) x 406.4 mm (16 inch) units per cycle, a throughput which, it is claimed to maximum advantage, can result in substantial savings per unit.



Above: Typical plant installation for the Columbia Model 50.

WEST AFRICAN CONSTRUCTION

For a machine this size, skilled and organised labour is essential, and the design reflects this; the sort of technological sophistication incorporated would be out of place on a smaller model. For all this, simplicity and ease of maintenance is a prime requisite. Hydraulics are located on one side of the machine, electronics on the other; large access doors on both sides provide plenty of safe, roomy working area.



Above: The far simpler set-up for the Columbia Model 5.

...e other end of the scale, Columbia ...tures the Model 5, which one man ...dle for limited production runs; for ...ous production, an additional man ...ed to operate the mixer and con... It is an ideal second machine for ... plants wanting to inexpensively ... modest quantity runs of standard, ...cial or speciality blocks. The com... machine is easily transported to the ... one truck, and requires only a 1.63 ... 1.18 m (64 inch x 86 inch) floor area, ...rhead height of 2.16 m (85 inches). ...mbia will also supply a wide range ...gs and accessories — everything in ...at a blockmaking plant will need. ...e top-of-the-range Model ..., for ...ple accessories include bins ... silos, ...ers, skip hoists, special mix ...trols, ...gate returns, block turnover ...litters, ...ing machines, block slump ... core ...ers, moulds, racks, rack loaders and a ...s transfer system. For the Model 5, a 12 ...batch mixer can be supplied together ...h a conveyor, pallets, moulds — including ...ir specials and decorative versions — ...ers, and an offbearer, a manually ...erated hydraulic arrangement which ...ves loaded pallets two at a time.

The same company also recently introduced its new Model BRK, designed exclusively to cube bricks in all popular sizes. Engineered for semi-automatic production, the operator forms a tier then ...es a button. The tier is automatically ...nsferred to the cube. Having received ...e tier, the cube indexes down the distance ...f one tier, ready to receive the next. ...justable side plates maintain a compact, ...en cube through assembly and delivery ...o the handling machine. The BRK handles ...ubes from 711.1 mm (28 inches) to 812.8 ...m (32 inches) wide, 889 mm (35 inches) ...o 1270 mm (50 inches) long, 1193.8 mm (47 inches) high and is available with right ...r left hand feed.

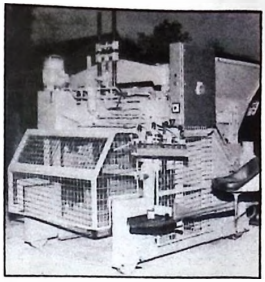
Blockmaking machines manufactured by UK company Lee Magnum can be divided into two main groups: manually operated static, and ground laying automatic. The manual machines are simple and robust, and a large number have been exported to the developing countries; the manufacturer claims a long working life for these models, of some 10 to 15 years with no spares requirements. The models available include the S4, which has an approximate output of 90 solid plain blocks/hour, and with facilities to produce double or tongues and grooved ends, rock faced blocks etc.; the SB, which can produce 300 frogged or plain bricks/hour, or be adjusted to make solid plain blocks up to 100 mm. thick; the HB1, which can make 90 large hollow blocks/hour, or which can be adjusted to make solid blocks; the HB2, which is similar to the previous model but which can also make rock faced blocks; the HB3, available with electric or diesel vibration; and the HBA, which has an output of 90 large hollow or solid plain blocks/hour, or alternatively 180, 100 mm. thick hollow or solid plain blocks/hour.

All these machines produce blocks on wooden or metal pallets. The block and pallet are both ejected from the machine's mould and carried away to a curing area by means of a manual block carrying tool provided with the machine.

Lee Magnum also manufactures two automatic models, known as Autobloc 1 and 2, which are ground laying block machines, the machine moving along automatically after laying each row of blocks. Block output/hour on the Autobloc 2 can be as high as 1,700 50 mm. blocks, if a hopper is used, and 1,360 if the mix is placed by feed barrow. The machine will manufacture all standard sizes up to 250 mm.

One of the special features of the Autobloc machines is the vibratory system used for compaction of the blocks. It involves the use of light tamping with pre and final vibration to give an evenly compacted result with an economical use of mix. The method of operation is that after the mould is filled and pre-vibration is complete, the tamper head drops under its own weight and vibration continues automatically until the block is evenly compacted to the correct density and size. Thereafter the mould box and tamper head lift automatically whilst vibration continues for a fraction of a second to break the suction of the mix on the mould. As the mould box and tamper continue to rise the machine moves forward automatically to the next position so that the operator has only to refill the mould to continue with a new working cycle.

Highbury Engineering (Mells) Ltd, of the UK, manufactures the 'Standard' blockmaking machine, which is one of the simpler, floorlayer type. A combination of mechanical, hydraulic and electrical functions makes it a semi-automatic machine, easy to operate and quickly understood by any operator. The design takes into account the need for accessibility to the moving parts, and simplifies maintenance.



The Highbury "Standard" floorlayer blockmaking machine; correct design for the making area is essential.

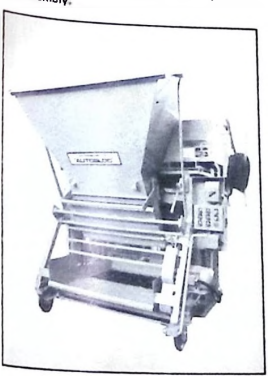
The advantage of this machine is that, whereas most other machines of this type produce only 10 to 12 blocks per drop, the Highbury Standard produces twice this number. The machine is particularly suitable for mass-producing cavity and solid blocks, chimney blocks, bricks, partition blocks and edging stones. Mould vibration allows the machine to use almost any type of material for their manufacture: sand, shingle, gravel, leka, shale, pumice, lytag, foam slag, ashes and partly straw are all suitable.

Taking for an example a concrete block of 215 mm high x 100 mm wide x 440 mm long, the Highbury Standard will produce 22 or 24 of these, in a steel mould, every 20-25 seconds, according to the type of aggregate used. Average output during a normal working day should be between 18,000 and 20,000 blocks. A batching plant of 1,000 litres capacity is needed for a maximum output, also a feed truck which will convey the mixing from the batching plant to the blockmaking machine.

To maximise production, a 100 m long by 60 m wide making area is required. This has to be concreted to very close limits, allowing a fall of approximately 450 mm on the 100 m length. For the preparation of this making area, Highbury recommends a hard core of between 228.6 mm (9 inches) and 304.8 mm (12 inches) depending on ground conditions, which should then be rolled and covered with a 152.44 mm (6 inch) layer of concrete. This should be a first class mix of 6:2, which means four parts of 12.7 mm ($\frac{1}{2}$ inch) aggregate, two parts sand and one part cement.

Highbury also manufactures the '3000', which is particularly suitable for use overseas, as it is a ruggedly-built machine, simple to use and of uncomplicated design. Again, it is of the floorlayer type, able to manufacture a wide range of block types and sizes. Output, based on 100 mm solid blocks, can be as high as 400 blocks per hour. For use overseas, the 300 is equipped with a diesel power unit. □

Lee Magnum's Autobloc 2 with hopper and feed assembly.



A complete plant layout from the primary crusher in Calabar.

ROCK CRUSHERS

Today there is a vast array of types and sizes of crushers. This article looks at the different types on the market, their advantages and applications.

BREAKING ROCK and stone has become a highly specialised industry and there is a vast difference between the end product of the modern crushing machines and the ill assorted qualities made by hand in the quarries attached to the world's penal institutes in former years when hard labour was thought to be the most effective way of reforming criminals. The mechanical rock crusher is now a highly specialised piece of machinery and since the first American patent of 1830, which was for a machine similar to the stamping mills used to reduce metalic ores, to the jaw crusher first patented in 1858, machinery for breaking rock has advanced to today's almost bewildering array of types and sizes.

As the raw material for high quality concrete and the main component of road surfacing materials, or for use as the foundation material for roads and buildings, broken rock must have a specification matched to the task it has to perform. This specification not only applies to the shape of the particles and requires a close control of angularity and size of the finished material. The modern crusher, in all its variations, is designed to do this with the minimum of power consumption and within tightly controlled limits of specification.

Crushers can be classified within various basic types, each with its special characteristics which are exploited when the machine is built into a complete crushing plant. It must be remembered that a crusher alone is of little practical use, it is only when it is coupled with all of the ancillary machinery necessary for its efficient working, that's its potential can be realised. Feeders to get only the usable rock into the crusher, conveyors to move the material to the next stage of processing, screens to separate the crushed material into the required sizes, storage facilities for variously graded particles, are all part of a complete crushing plant. Such a simple, single stage crushing plant is illustrated in Fig 1 overleaf.

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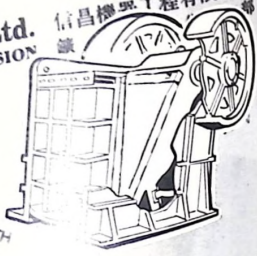

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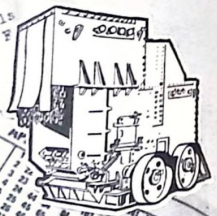

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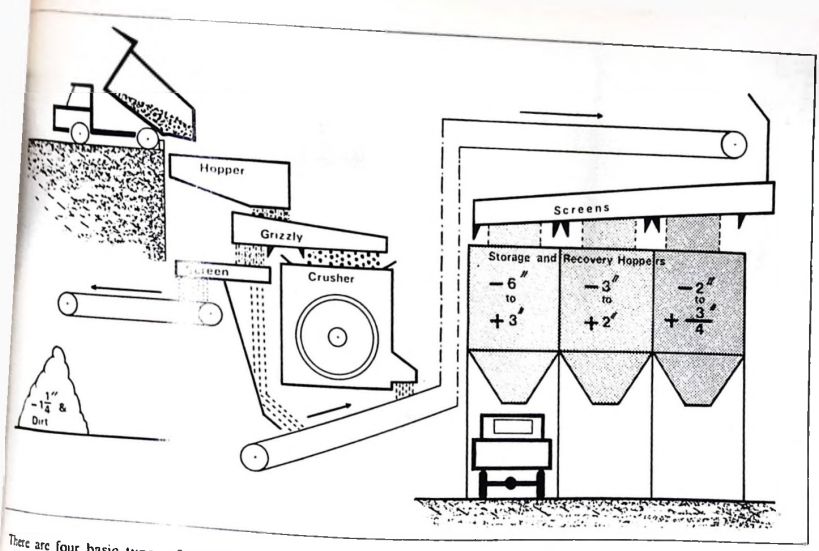

There are four basic types of crushing machines although some of them can be further sub-divided within these broad categories because their characteristics can be altered to effect a different action designed to cater for variations in the raw material or in the finished product.

The jaw crusher

This is the basic primary crusher which breaks the rock by nipping it between the fixed plate and a reciprocating jaw moved by a toggle coupled to an eccentric shaft. When very hard rock has to be broken, a variant of this machine, called the double toggle jaw crusher, can be installed as an alternative.

The jaws on these machines can be adjusted, in some cases by adding shims behind the back plate or in others by a system of jacking screws, to control the size of the crusher itself. This clearance, usually called the "nip", controls the size of the finished product and the Parker "V" model, 30 by 18 can, for instance, be adjusted to produce a particle size ranging from 5 inches (125 mm.) to 2 inches (50 mm.) from an acceptance size of 16 inches (420 mm.) fed into the machine. The size of a crusher is designated by the dimensions of the mouth and the smaller of these is termed the "acceptance size", of the crusher. This does not mean that pieces of rock with *one* side longer than the acceptance side will not go in, although, unless they are able to turn freely as they are being fed so that they are accommodated within the larger side of the opening, there is always the possibility of a jam. The jamming of a crusher by oversize pieces of rock, causes very expensive holdups until they are cleared but much can be done to avoid these hold ups by the design of the feed mechanism so that oversize is rejected before it enters the crusher mouth. The control of oversize can, with advantage, be assisted at the quarry face by carefully choosing the bucket size of the loading machines, either excavator or loading shovels, so that these machines have the effect of pre-screening the rock on the principal that "if it will go through the bucket, it will go into the crusher". In this way, the amount of oversize entering the processing plant will be reduced to a minimum with the consequent cost saving of not having to re-cycle it for further breaking before it can be satisfactorily handled by the crusher.

Large single toggle jaw crusher from Babbitless mounted on a fully mobile chassis complete with product conveyor. A separate sump hopper and scalper/feeder assembly would be necessary.

Vast range of sizes

Jaw crushers are available in a vast range of sizes and should be chosen for the output required rather than the size of the material they produce because, for making small material, it will be essential to install secondary or even tertiary crushers as it is almost impossible to have a single crusher with a sufficiently large reduction ration (acceptance size: output size) to produce small particle sizes at only one pass. For example, where an output of 240 tons/hour is required, it would mean installing a primary crusher of at least 60" by 48" acceptance size and this would not produce a finished particle size much below 5" (127 mm.). Quite suitable for feeding into a secondary crusher or even for immediate use as hardcore, but far too large as concrete aggregate or roadstone for finishing material. It is always possible to install small crushers in tandem to increase the output, but this practice makes for more expensive working because the fragmentation during primary blasting must be high to keep the material as small as possible, otherwise the cost of secondary breaking, either by explosives or mechanical breakers, increases the quarrying costs. Add to this the cost of only being able to use small bucketed machines for loading the dumpers and it will prove the truth of the rule that where the output is large, "the

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bigger the crusher the better". Even if the full potential of the crusher is never realised, it is often sensible to consider installing one to take advantage of the greater acceptance size and consequently ut down the costs of secondary breaking the face, also one can take advantage of lower operating costs of one big keted loading machine, as opposed to aps two or more smaller ones.

e modern jaw crusher is an extremely e machine and the increasing use of anganese alloy steels for the wearing s given them a prolonged working

t breakers

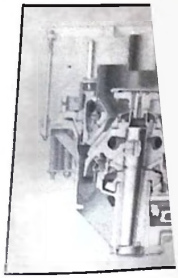
achines really fall into one of ies although the difference is ethod of producing the impact uch difference in the finished roduce. Known in the finished ills and in the other as Breakers, they offer some dvantages in the type of make. Impact breakers to the type of rock being jaw crushers, and are less abrasive nature. e action produces a al shape with rough ood 'locking action' mpacted into the his is dry laid sub- ete of rock has sur- the breaking of natural lines itself. The k when the rock eadily struck mmers and he breaker achine, to one their Once are complete

absence of any crushing or rolling action results in a product of exceptional strength which is free from "flats" and of good shape.

Independent tests carried out by London Consulting Engineers, have shown that road surfaces made with stone produced from an Impact Breaker, gives 50% better wearing properties and the sharp, cubic form increases the strength of concrete by as much as 600 lb./in². One of the most useful features of impact breakers is the very high reduction ratio and quite small particle sizes are achieved with only one pass. For example, the Parker Sledge Kubit, a rotary impact breaker with an acceptance size of 42" by 48", will make 3" particles (—76 mm.) at the rate of 250 tons (158 m³) per hour and with a low power consumption than an equivalent size of jaw crusher — 80 horsepower as opposed to the near 110 horsepower of the reciprocating crusher. The particle sizes of impact breakers are altered by changing the speed at which the rotor turns, a slow speed producing larger particles than a higher speed and when small particles are required, it is better to run the material through the breaker twice as this will give a higher output and considerably reduce the strain on the machine. Impact breakers are much cleaner in operation than most other types of rock crushers, and produce very little dust in comparison to their output.

Gyratory and cone crushers

These machines have a conical or domed crushing member, which is moved in a small circle around a vertical axis by means of an eccentric, inside a fixed bowl or 'mantel' as it is called. The gap between the cone and the mantel is larger at the top than the bottom and as the rock is trapped between the two members, it is broken and falls vertically further into the crushing chamber where the progressively reducing clearance reduced the particles to the required size. Adjustment for finished size is made by changing the amount of engagement of the cone with the mantel. Gyratory crushers produce a good grade of material and are especially suited to hard rocks. Mineral ores, or to rock which tends to be stratified or of laminar format which, in a crusher, have the tendancy to break 'slabs' rather than the preferred cubic shape. More suited to the harder rocks of the crushing method, the jaw crushers are not suitable for the duty, especially if they should be a sticky rock which compacts between the crushing members and can completely choke the machine. This will mean frequent stopping and expensive downtime for cleaning machine is cleared out. Although gyratory crushers are made for primary crushing are at their best when working with crushers and being fed with



Symon's extra heavy duty g

material of a uniform size machine will work faster and more consistent particle size.

When using gyratory crusher speed and distance of travel of th between rotations must be careful raised. A wide space allows the to fall more quickly than a narrow coupled with a slow rotation, woul pieces to fall too far before th time round again for the next impa the other hand, fast gyration and a travel would not allow them to fal enough and this would be wasteful power and produce an uneven particle s The power requirements of gyrato crushers is rather higher than other types, machine producing some 150 tons/hour for instance, would require 125 horsepower to drive it, whereas an impact breaker with similar production rate, would only need 90 horsepower. The height of gyratory machines is much greater than other types and can present problems of accommoda tion when being installed, especially in fixed plants where considerable excavating may be necessary to obtain the correct levels or feeder-crusher and conveyors.

Roll crushers

These machines are made to produce very fine grades of material and they are installed as secondary or tertiary crushers. They demand a uniform size of feed material for the best results and they are capable of making ¼" (6 mm.) particles in the smaller sizes, with an output in the region of 20 tons/hour. The largest machines will make ¼" material with feed sizes the rate of 170 tons/hour with feed sizes ranging from 1" (25 mm.) to 3¾" (95 mm.). As the name implies, these machines crush the rock between rollers which may be quite plain on their surface or serrated according to the type of rock with which they are dealing. Roller crushers are very compact and lend themselves readily to use in mobile crushing plants or even as independent units where large amounts of fines are needed on a particular site, when the only ancillary machinery will be some form of loading shovel for the feed, and a conveyor to take the finished material to stock piles, transport vehicles, or feed it directly into a concrete batching plant for instance. The horsepower requirements of

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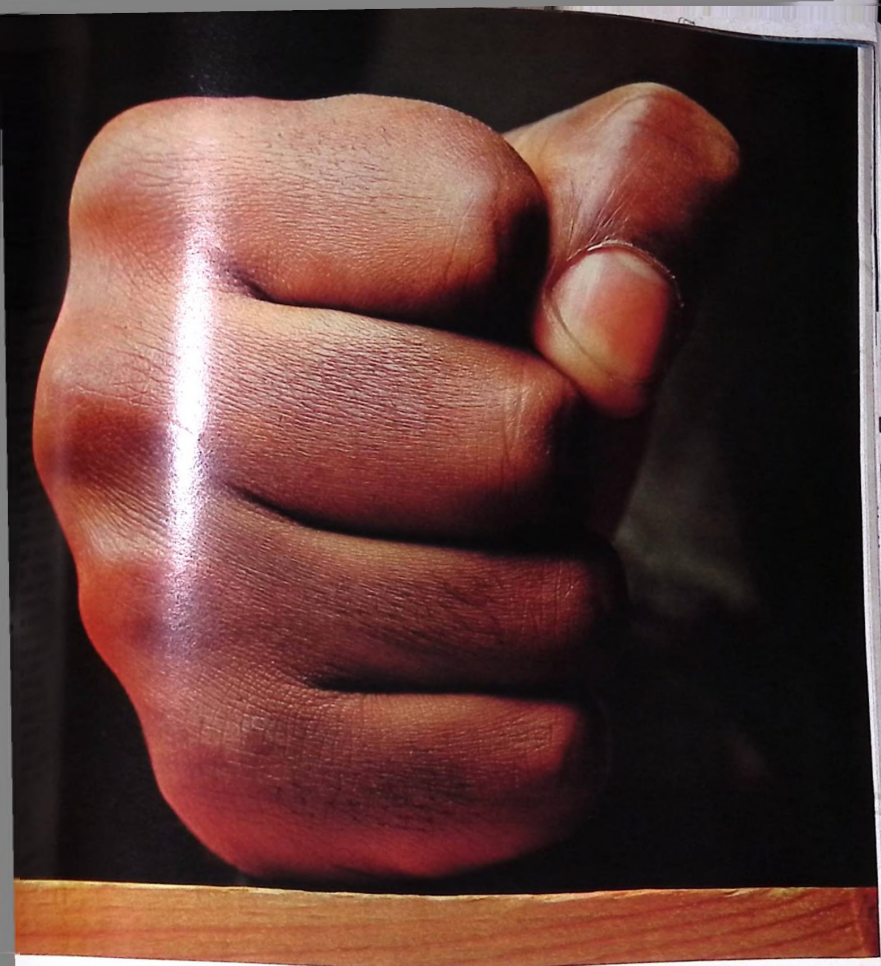

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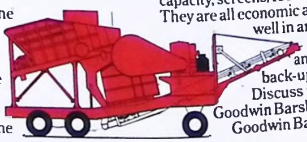

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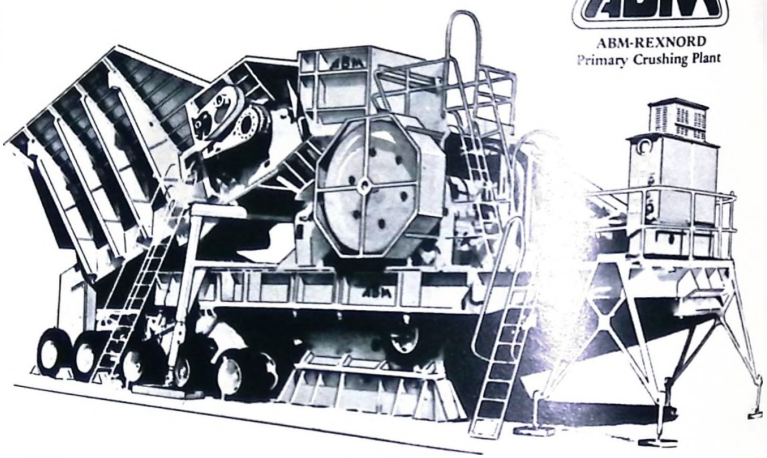

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...shers are comparatively low in ...ion to their output and the largest ...ne, 40 by 32 (1,015 by 815 mm.), will ...quire about 125 horsepower at full ...d produce 170 ton/hour. Adjustment ...ticle size on roll crushers is made by ...ing the gap between the rolls either ...ting screws or by inserting or remov... ...metal shim plates.

Granulators

...Most crushers are not re... an ...ular type but are variants ... other ...ized types of machines. Jaw, C... tory ...ers crushers can all become gra... tors ...ver special crushing plates are ...ed to ...duce very fine particle sizes ... (19 ...m.) and down is considered to ... in the ...ular class. Granulators mu... e fed ...m a stock of small, uniform size f... e best ...ults are 2" (51 mm.) is consid... ...t to be ...the largest size with which a ...nulator ...ould be supplied. Outputs ... these ...ances vary considerably, but ... indica... ...of performance can be gain... ...om the ...formance of a Parker 42" ...nesizer ...ulator" which, fed with 2... ...ock, will ...duce between 23 and 32 ...ons/hour ...ing only 70 to 80 horsepower to drive it. ...Many Primary Jaw crushers can be con... ...ted into granulators for occasional use ... fitting special jaw and back plates, but ...where a continuous supply of fines is ...required, it is better to consider incorporat... ...g a roll crusher into the plant.

Material sizes

At first sight, the specification of crushed rock particle sizes seems a little confusing and one reads of –6" to +3" or perhaps –2" to +¼". What this means in practice is that the particles have been put through sizing, or as they are alternatively called, verifying screens, to produce particles that, in the first example will pass a 6" screen but will not go through a 3" screen and in the second example will pass a 2" screen but will not go through a ¼". Screen sizes too can be confusing as there is a difference between "Space Size" and "Mesh Size".

Space size is the distance between the wires or bars forming the screen and represents the size of material it will pass. Mesh size is the distance measured centre to centre of the wires or bars and comparing mesh size and space size indicates the thickness of the material from which the screen has been made. In punched or drilled screens made from steel plate, the size quoted will always represent the size of material that the screen will pass. It is important therefore to always specify screen sizes by the *space* size as this governs the size of finished particle. In some steel plate screens the holes are drilled as this is the easiest way of making them and the holes are therefore round, and it must be noted that a square hole, as formed by a woven screen will pass particles larger than a round hole of the same diameter because the distance across the diagonals is greater than the diameter. A 1" diameter round hole will only pass 1" particles, a 1" square hole will allow particles up to 1¼" to go through.

Screens

The primary crusher is the heart of a rock preparation plant but before it can do its work it must be designed into a complete production unit and the screens play a very important part in the efficient working of the whole plant. Screens take many forms, depending on the job they have to do, from the primary screen, usually called the "Grizzly", to the intermediate screens designed to remove unwanted material such as loose overburden and trash to prevent it from getting into the crusher.

A mobile rock processing plant with primary and secondary units from IBAC.

Mobile primary feeder and crusher from Braham Miller with a capacity of 100/120 tonnes per hour of rock.

These screens are often called "Scalping Screens", and after removing the rubbish, they return the usable rock back into the crusher run. Further along the production line come the sizing or verifying screens which, in fixed installations, are situated over the storage bins and in a mobile plant deposit their burden onto conveyors for ground storage. Sizing screens may be of the rotary type especially when they are installed in sand and gravel preparation plants where the final screening is often performed wet, or they may be of the stacked or superposed type which is more compact and suited better to mobile or transportable plants. The grizzly is a massive unit consisting of thick steel bars or rails which are often mechanically vibrated to assist the free flow of the material passing over and through them. Often a transverse bar is fitted at the end of the grizzly to prevent oversize from falling into the crusher and jamming it, or the bars, where they pass over the crusher mouth are set at the acceptance size and will automatically reject oversize and dump it to one side ready for further breaking before being returned to the crusher run. On fixed installations it is useful to have a hoist installed over the crusher mouth so that in the event of oversize missing the

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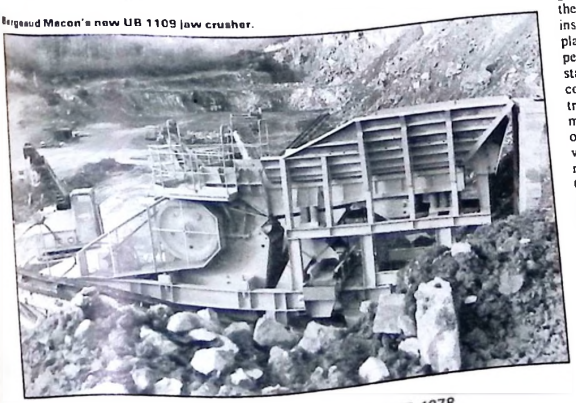
Bergeaud Macon's new UB 1109 jaw crusher.



ing process for any reason, it can be ed with the minimum effort and Intermediate and sizing screens are of the vibrating type, as the ting action assists the material to over them as well as to shake it the appropriate openings.

bile or fixed tallation?

many rock quarries and certainly in and gravel industry, there is an ing move towards the use of port- crushing and screening plants ead the massive fixed installatio The ntages of a mobile unit lie in cost ness as much as the obvio ne of bility. Even in quarries cing ed roadstone, a process whic uires ge fixed installation for final ess, the use of a mobile or sport- primary crusher has many ntages se the crushing can be don own to esistant size at the point ere the ating is taking place and only graded erial with a 100% usability tor has be transported to the final breaking and essing plant. Perhaps the biggest back to mobile plants making a ety of particle sizes, is the problem of erial recovery because it is both ficult and costly to make portable bins to re and provide a gravity feed into the sport vehicle. The finished material is ed in scattered ground piles and uires some form of loading shovel to re- handle them into lorries or dumpers. Port- ble conveyors placed beneath the outlets of the variously sized particles, leave them in scattered heaps as shown on the drawing of the Brown Lennox plant.

There needs to be plenty of room around a portable or transportable plant to allow

The Parker mobile crushing, screening and stockpiling plants at Akure.

the recovery loading shovels and the transport vehicles to operate. The civil engineering work necessary for a big fixed installation will be quite expensive and as the working face recedes, the cost of transporting the excavated material to the preparation plant will also increase, but since the cost of re-locating the plant will be prohibitive, there is a strong case to be made for

considering the use of a mobile unit if only for the primary crushing and screening part of the process. Certainly for the preparation of rock for a specific contract of known duration, the cost effectiveness of a portable plant will completely outweigh the building of a fixed installation. In the sand and gravel industry too, the ability to take the preparation plant right up to the point of excavation, shows tremendous savings on the cost of internal transport although there are some problems of obtaining and disposing of water when wet screening is undertaken as is often necessary with the preparation of sand for high quality concrete work. Mobile or transportable units are particularly well suited to operation in more remote parts of the world where internal highways may not be available or suitable for long distance hauling of finished material. To be able to move the preparation plant to the point at which its product is required, provided always that there is rock there in the first place, offers attractions which are reflected in the ever increasing demand for portables as is reported to be the case by almost all of the makers. Present day thinking seems to say "take the crusher to the rock, not the other way round."

A 36 x 30 Goliath mobile primary plant from Goodwin Barsby is crushing and screening gravel for aggregate.

The choice of a machine

There are a good many factors to be considered before purchasing any crushing plant, not the least is the type of rock to be treated. Very hard rock with a crushing strength of approximately 71 116.5 lbf./in² (5,000 kgf./cm²) may demand the use of a double toggle jaw crusher as the primary machine, whereas a less hard material, with a crushing strength of 35 558.25 lbf./in² (2,500 kgf./cm²) can be handled with single toggle machines very easily. The composition of the rock will have a significant bearing on the material used in the construction of the crusher jaws. A high silica content, which will gave a high abrasive factor, will demand a different alloy to the softer limestones and possibly a different profile to the ribbing of the jaws to prevent clogging. It is important therefore that, when crushing plant is contemplated, as much information as possible about the geological formation of the rock is given to the makers from whom quotations are being sought. There are some companies, notably Messrs. Stothert and Pitt of UK,

Continued

A Sheepbridge skid mounted 3042 single toggle jaw crushing unit, part of a N390,000 order for the Nigerian Granite Co. Ltd.

APPROXIMATE OUTPUT CAPACITIES OF GYRATORY CRUSHERS

SIZE. Inches.	MIN. DISCHARGE OPENING. Inches.	OUTPUT Tons/Hour.	MAX. DISCHARGE OPENING. Inches.	OUTPUT Tons/Hour.	App. Horsepower required.
2.0	0.375	0.5	0.5	0.75	3
8.0	1.0	15.0	2.0	40.0	20
12.0	2.0	40.0	2.75	70.0	45
16.0	2.5	100.0	4.5	160.0	80
20.0	3.0	150.0	5.0	250.0	125
26.0	3.5	225.0	6.0	400.0	150
36.0	4.5	370.0	7.0	600.0	225
42.0	5.0	420.0	7.5	700.0	250
48.0	5.5	750.0	9.0	1 200.0	300
54.0	6.2	900.0	9.5	1 600.0	350
60.0	7.0	1 200.0	10.0	2 000.0	400
72.0	9.0	2 000.0	12.0	3 000.0	500

...material weighing 100 pounds per ... foot.

...no do not themselves make ...ushing machinery but who specialise ...building complete rock preparation plan... and use brokers either of the customer's choice or even the most suitable machine after all the factors governing the work have been carefully considered.

Deciding on the size of the plant is a specialised job and only by experience can all of the required factors be correctly assessed. It is better if the makers are appraised of the requirements and used as consultants to suggest the best combination of machinery to provide exactly what is required. This does not mean to say that the average buyer of rock plants is necessarily ignorant of his needs, but such plants are bought only occasionally and the expertise involved in designing such equipment can only come from long experience, the makers have this experience and are always willing to co-operate with a buyer to be certain that the maximum benefit is obtained from the expenditure of a not inconsiderable sum of money. For instance. It is so easy to buy equipment that is too small for the job in hand, since output figures can be confused with throughput quantities when the size of a plant is being decided.

The amount of finished material required can be estimated from either customer use assessments in the case of a plant making stone for direct re-sale, or from the quantity surveyors estimates in the case of a plant installed for a specific contract but, the finished material is only a proportion of the quantity entering the crusher house and is a proportion which will vary considerably from one quarry to the next. The quantity of throughput to be transported and processed will be decided as far back in the production line as the primary blast and because different methods of blasting produce different amounts of waste, which will have to be screened out before crushing begins, the amount to be handled by the feeder and or grizzly may be totally different to the amount actually being crushed. A point which is very often overlooked. In some quarries it is often more convenient to bring down the overburden with the primary blast as a more economical method to stripping it off first, as it can be removed very easily by a scalping screen introduced between the grizzly and the crusher mouth, but of course this way of working again increases the throughput of the plant and requires special designs considerations to accommodate the waste. From the simple, single stage primary producing only run of crusher material, to the complex installations designed to make a variety of particle sizes and store them for automated recovery from a hopper system, or even feed them into further processing plants for making concrete or road surfacing materials, the makers will always use their vast experience to get the job right and they should always be consulted before a decision is made. Somewhere in the production line it will often be necessary to make provision for the possible breakdown of the various machines comprising the complete plant, by stripping off part of the production and holding it in surge piles ready for immediate recovery. Conveyors can be installed to effect this work and there will always be a supply of material available to keep this work and there will always be a supply of material available to keep the plant working should a holdup occur or repairs have to be undertaken.

These and other factors, such as dust recovery for use as a filler in asphalt plants, or as a saleable commodity to agriculture when especially limestone is being processed, are all points for consideration when a permanent installation is being contemplated. The crushing of rock has passed beyong the simple method of making road metal to the scientific production of closely specified building materials and the makers justifyable pride in their machines is reflected in their unstinting assistance in matching the machine to the job. □

APPROXIMATE OUTPUT CAPACITIES OF JAW TYPE CRUSHERS

SIZE. Inches.	MIN. DISCHARGE OPENING. Inches.	OUTPUT Tons/Hour.	MAX. DISCHARGE OPENING. Inches.	OUTPUT Tons/Hour.	App. Horsepower required
16 by 10	1.5	15	4.0	45	15
24 by 15	2.0	30	5.0	80	35
36 by 24	3.0	75	6.0	160	75
42 by 40	4.0	130	8.0	250	125
48 by 36	5.0	175	8.0	275	150
48 by 42	5.0	175	8.0	275	150
60 by 48	5.0	240	9.0	450	200
84 by 56	8.0	350	12.0	600	200
84 by 60	8.0	350	12.0	600	250
84 by 66	8.0	400	12.0	600	250

For material weighing 100 pounds per cubic foot.

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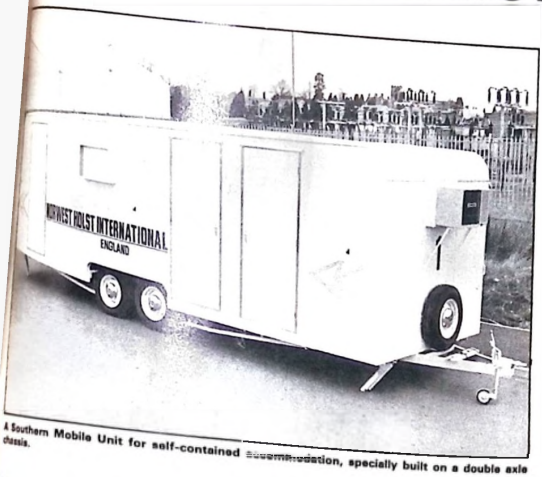

A Southern Mobile Unit for self-contained accommodation, specially built on a double axle chassis.

Mobile housing have many advantages over other types of accommodation. This article defines the term "mobile accommodation units" and looks at the wide variety of units suited to West African conditions.

'MOBILE' IS a frequently misused and misunderstood word. When a West African importer sends an enquiry to a European or American manufacturer for mobile accommodation it often requires an exchange of messages before "mobile" is defined.

In our article on instant accommodation in June we split pre-fabricated buildings into three

1) Instant, fully erected in the factory.
2) Instant, site erected.
3) System, site erected from pre-fabricated system components.

The instant building is a box structure whereas system building refers largely to volumetric housing construction requiring conventional foundations.

A "transportable" building must mean an instant building. But is a mobile building any type of instant building? Some manufacturers think so — and they could be misleading.

Any reasonable comprehensive dictionary defines 'mobile' as 'easily moved or movable'. And 'easily' is the key word. It is becoming commonly accepted in English useage that mobile means on wheels (even though, as in the case of cranes, the wheels may run on rails or be track layers).

So, "mobile accommodation" should mean an instant building on its own wheels, either self-propelled or capable of being towed. If you take the wheels off and never use them again you have probably wasted your money buying a structure with chassis, axle, wheels, brakes, etc., in the first place.

The only overlap area where definition becomes difficult is in the use of a slave chassis. This is a fully equipped and roadworthy chassis, purpose-built for a particular instant building, which can either remain stabilised under the building on site or the building can be jacked off and the chassis used to bring another and subsequent building onto site.

You could also include in this overlap category the type of demountable accommodation unit manufactured by Multicruiser Ltd., and secured to the flat bed of a pickup truck. These units have four jacking legs and so, without the truck, become a caravan without wheels but with the attributes of a jack-cabin.

A caravan is mobile accommodation — an instant building. The British government, in producing legislation to control caravan sites, defines 'mobile home' as meaning 'caravan' (Caravan Sites and Control of Development Act 1960 as amended by the Caravans Sites Act 1968) but implies that it need not have wheels!

However the word 'caravan' is now rarely used by either manufacturers or buyers of mobile accommodation, either for industrial, commercial or public sector purposes.

Of the three main types of caravan

1) Touring caravans
2) 'Static' holiday caravans
3) 'Permanent' residential caravans

only this last category could be considered for construction site use except in emergencies.

Types of mobile units

The basic types of mobile units are as follows:

1) Caravan (towed)
2) Demountable caravan body slave chassis or pick up truck
3) Self propelled (Motor caravans)
4) Instant box structure on its own chassis
5) Instant box structure on slave chassis
6) Converted passenger carrying vehicle.

The choice of which type obviously depends on many factors. Firstly, the user must be absolutely sure how much mobility he requires. If he buys mobile he is paying extra for the ability to tow. He must remember that the deterioration of chassis, tyres, braking and towing equipment, particularly in tropical conditions can make short work of his investment in mobility. Short term locations require mobiles or the necessary facilities to provide labour and transport to move skidded or jack leg units.

A typical Multicruiser with an accommodation unit jacked off its own pick-up truck.

Many of the caravans manufactured in Western Europe, even when called

Continued

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...strial-quality or heavy-duty, ...factured in Western Europe are ill ...d for use on construction sites. It is ...that when specifying accommodation ...this type the buyer insists on full ...suitability for West African conditions ...ding suitability for road travel in the ...of use.

Perhaps the best general purpose units ...site use are the tropical specification ...ant mobiles which are mounted on ...ble chassis with close coupled twin ...les.

A typical building of this ... would measure about 7 m. x 2.4 ... overall though there is little difficulty ... obtaining units up to 12 m. long.

It would be built for travel ... rougher roads using wheels which could ... replaced more easily e.g. Land Rover ...heels. It could carry spare wheel and ...e, spare coupling, shock absorbers and ...ngs.

The body framework would ...e treated hardwood with aluminium ... cladding bonded to exterior grade plywood. It would have a one-piece profiled ...inium roof with gutters. Floors, walls and ceilings would be insulated to tropical specifications.

Interior arrangements infinitely variable

The interior arrangements of these mobile residential units are, of course infinitely variable. Many offer a bedroom/lounge/kitchen combination. Kitchens have sinks with water tanks, fridge/freezers, cookers. Bedrooms have showers and chemical toilets. There are not many manufacturers of tropical mobiles who do not provide:—

Air conditioners
Refrigeration
Insect screens on doors and windows
Awnings
Water storage and filtration systems
Bottled gas
Anti-vandal window shutters
Portable generators.

The degree of self-sufficiency necessary depends on site facilities. The user may require:—

a) Self sufficiency as a unit
b) Self sufficiency as a combination of units
c) Reliance on mains services.

The Rollalong Mk IV Trailer Mounted Cabin which has additional, and larger windows. Metal shutters are available as an optional extra.

WEST AFRICAN CONSTRUCTION

Most mobiles can be equipped so that the plumbing and electrical systems can be easily adapted to either self sufficiency or reliance on some central system.

Some manufactureres will provide com-

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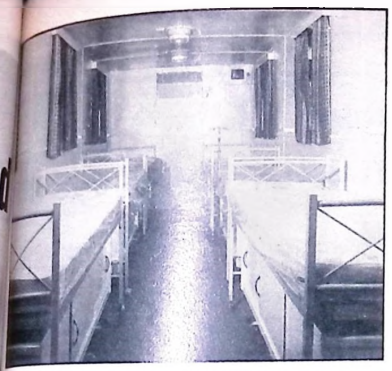

Interior of a Medical Supply A[illegible]iation mobile hospital unit.

Torton Mobile Unit showing a classroom 6.7 m. x 2.3 m. extended to 6.7 m. x 6.4 m. by pull out extensions in 30 minutes.

Continued

[illegible] camp complexes using mobile units.

In addition to the usual offices, dormitories, kitchens and toilet units, matched mobile generators, water bowsers and site lighting can all be provided as towed units.

However, while agreeing that a mobile complex provided by one manufacturer on a turn-key basis certainly reduces the potential users administrative load in purchasing, it can often increase his costs. This particularly applies to buying mobile complexes for general rather than specialist purposes. Few manufacturers of mobile accommodation also build their own mobile generators or mobile lighting units and consequently such parts of a package are frequently overpriced.

Turn-Keys best in specialist fields

Where turn-key purchases are rewarding is in specialist fields. A good example is the mobile hospital as supplied by the Medical Supply Association (International) Ltd. and by Ratlalong Ltd. They offer a fully equipped 60 bed mobile hospital with every piece of equipment, both medical and domestic. The 26 trailers are fully tropicalised with air conditioning, insulation, tropical roofs, fly screens and dust sealing. Windows, which are safety glazed, are fitted with rubber dust seals and exterior protective canopies. Wall mounted air conditioners incorporate 2 Kw. heating elements.

The hospital is powered by four 40 Kw. diesel engine generating sets. At night the hospital site is lit by four 500 W. floodlights.

Each hospital has units for surgery, consultation and treatment, X-ray, dental surgery, laboratory, patients accommodation, staff accommodation, kitchens, diner and rest room.

Large choice of options

There is hardly anything that cannot be put on wheels provided there is a chassis big enough and that road regulations allow it. Some of the units offered in Europe now include:—

Offices; shops; banks; blood banks; cinemas; libraries; bath and shower units; kitchens; canteens; laboratories; dormitories; workshops — even with an overhead gantry crane for moving heavy components to be serviced or machined; control cabins with switchgear and consuls for process plant operation; class rooms; radio stations; polling booths. studios; drawing offices; cold stores; recreation rooms; dark rooms; boiler houses; security units; decontamination units.

The list will continue to increase. And the mobile accommodation market will continue to grow in those countries where the construction industry flourishes and where there are remote areas with isolated communities in groups not large enough to sustain permanent facilities.

It is important that governments understand the peculiar legislative no-mans land of mobile accommodation. The part that mobiles play is often vital and humane. They need to be carefully considered in legislation. In fact they need to be specially considered. And where building regulations apply, they should be special regulations to suit the specific characteristics of mobile accommodation — not lost in a limbo between holiday caravans and bricks and mortar.

When there are no longer remote areas and when the construction industry requires far fewer mobile units, then manufacturers in Africa and Europe will probably turn their attention to the fact that, in the USA, one in five American homes, is a mobile. □

A Boyton Mobile Site Office from Boston System Buildings Ltd.

Footnote: If mobile means "easily moved" then this article should also have discussed units for waterways! There are sites so close to waterways that many of the site services could be waterborne. All the special uses listed earlier for trailer based units can also be marine based.

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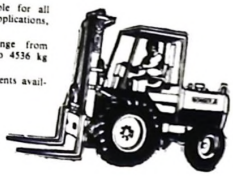

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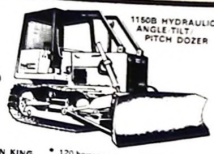

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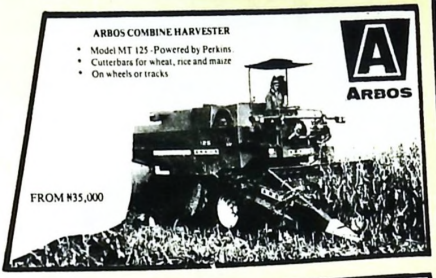

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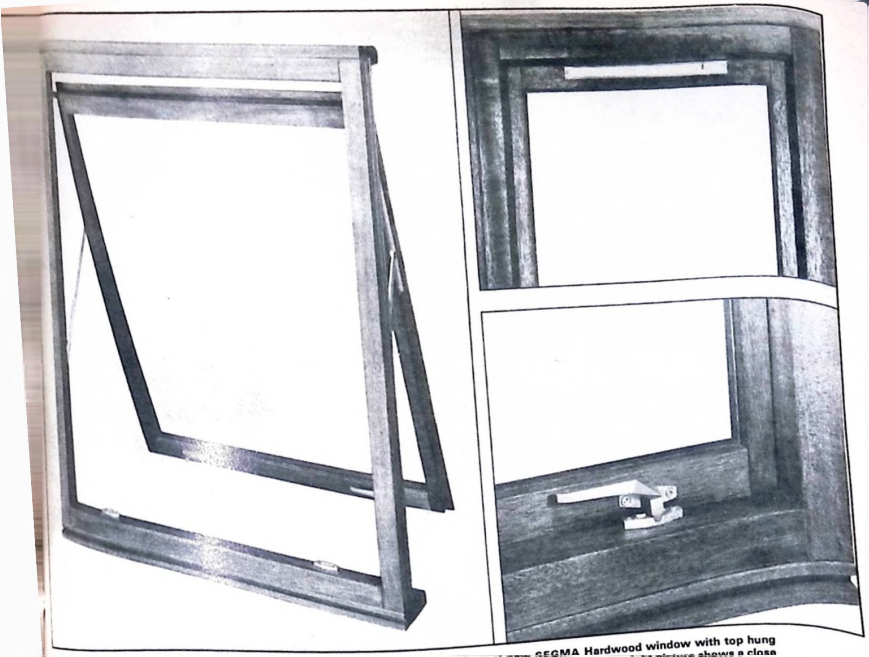


On the left of the above photograph is an example of a Rippers' new SEGMA Hardwood window with top hung sash. The top right of the picture shows detail of optional ventilation fitting. The bottom right picture shows a close up detail of the fastening handle.

TIMBER WINDOWS IN WEST AFRICA

No other building material has withstood the test of time in such varied climatic conditions as West African timber, now with the added protection provided by modern technology against insect and fungi attack, there can hardly be a more suitable material for windows. This article discusses the suitability of timber for windows and outlines the latest developments in window design.

AFRICAN TIMBER has over a period of many years proved to be the most desirable material for the manufacture of windows. Its durability and strength can be compared favourably with all other timbers and even more so with aluminium, steel, or plastic.

The major advantages of African timber over steel, aluminium or plastic are:

a) Thermal conductivity
b) It can be machined to any desirable profile economically
c) Durability in any of the world's climatic conditions and not vulnerable to ultra violet rays of the sun or salt from the seas let alone industrial pollution in the atmosphere.

Windows manufactured in timber allow customers to match their requirements with complete freedom of design owing to the ease in which timber can be machined and cut to specific details. The finished product can be polished allowing all the beauty and natural characteristics of timber to enhance the warmth and quality of new buildings or it can be painted to blend sympathetically with individual decoration tastes.

WEST AFRICAN CONSTRUCTION

No other building material has withstood the test of time in such varied climatic conditions. With the added protection devised by modern technology against insect and fungi attack there cannot be a more suitable material for windows.

The ease with which site adjustment can be made to cater for tolerance caused by adjacent materials and labour skills should not be underestimated; no other material can offer the same flexibility.

Consider timber's low coefficient of expansion and compare it with other materials: it is the only material which can withstand climates where there are appreciable differences between day and night temperatures without the need for large expansion joints.

Timber is a living organism and nature has evolved its own formula for withstanding the conditions it creates. Man made

Continued

...ials have never managed to overcome ...l conditions.

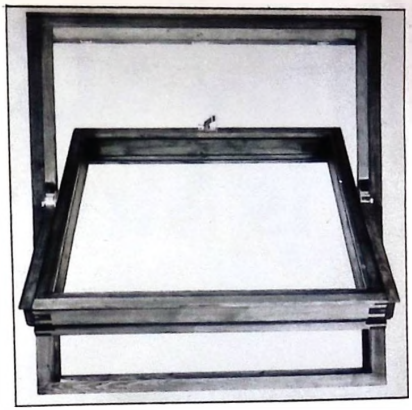
Timber is the most natural material for ...ows. It allows designs to incorporate ...ions and profiles which are most pleas... the eye with the necessary strength ...understand storms or hurricanes. Designs ...be produced without the concern for ...t extrusion dies or the on-cost of non-...dard profiles.

WEST AFRICAN CONSTRUCTION

African timber not only range... amongst ...e most durable species but it ... gives ...e attractive finish and lustre ... not only ...hogany type timbers can pro...

Some of the largest and m... famous ...evelopments in the major ... of the ...orld incorporate timbe... windows ...nufactured from African ...rdwood. ...r example, the Barbican ...heme in ...ondon designed by Cham... Powell ...d Bon Architect constructe... Utile and ...ished with clear varnish.

The construction industry ... now at a ...aze when it can no longe... consider a ...window frame just as a glass carrier or the ...easest possible way of filling a hole in a ...all. There are many new aspects to ...window design which require consideration ...by both user and producer to meet modern ...day requirements.



This picture shows a new Perma horizontal pivoted coupled sash, double glazed window

New aspects to design

Improved thermal and sound insulation are necessary but this increases the weight of the window which necessitates further consideration of the method of opening sashes for ventilation and the strength of ironmongery that can be used to meet modern day safety requirements.

Both thermal and sound insulation involve double glazing and it is therefore necessary to consider the case in which the glass can be cleaned. Not least of modern day window design criteria is the economic use of raw material from which the window is manufactured. It is also necessary to ensure accuracy in dimension and profile to obtain performance guarantee.

Rippers Ltd. window manufacturers have a design team and testing facilities which enable them to develop windows suitable for anywhere in the world.

Continued

ong experience in specialised fields
ally to the launch of a new high-
ance range of windows called

Perma Window

Perma Window is a purpose made
system designed to meet high
mance requirements in thermal and
insulation witha very high resistance
and water penetration.
rpose made' means that it is
factured to architect or custom size
ments allowing complete freedom of
n or elevational layout for opening
ed lights with only the basic sections
termined.
is a timber construction which can be
nufactured in hardwood or softwood
paint, stain or varnish decorative
sh.
The Perma window system is divided
two basic categories which relate to
method of opening the main opening
ht:
Horizontal Pivot
Turn Tilt.
The horizontal pivot opening light has
ver the past twenty years proved to be an
ceptable form of opening which
cilitates easy cleaning of the glass. The
ndow is designed for single glazing,
aled cavity double glazing or coupled
ith ventilated double glazing which gives
ery high thermal sound insulation.
Although it is not restricted to one specific
uite of ironmongery it is preferred that
double axis controlled friction pivots are
used, with self locating restricting safety
stops to prevent the sash opening beyond
safe limits for normal ventilating purposes.
The advantage of double axis pivots is
that not only can the window be rotated
fully through 180° for cleaning purposes
but that the sash is always rotating in a
balanced position with the added
advantage of reduced strain on the friction

A good example of hardwood window frames which are widely used in colleges, schools and research laboratories

in the initial stages of opening thereby reducing the physical effort required to operate them.

WEST AFRICAN CONSTRUCTION

Pivotted sashes are locked closed with minimum 5 point locking espagnolette bolts which are totally concealed and operated by a single operating handle. A reverse locking, self locating catch is supplied to ensure complete safety when the window is reversed for cleaning purposes.

In the case of double glazed coupled sash windows the outer sash is side hung to the inner sash in such a way that all glass surfaces can be cleaned from inside the building when the opening light is rotated 180°.

The basic timber sections have been designed to allow or include alternative forms of opening lights such as top hung, bottom hung, or side hung and infill panels of fixed glass, timber boarding or proprietary infill panels.

The system can be incorporated in curtain wall construction or manufacture in single units and because the basic raw material is timber the sections can be modified to accommodate plaster rebates or special grooves in the back edges or even other architectural features that may be required.

The Turn Tilt method of opening the main opening light is a system designed to avoid sash projections onto a balcony or public thoroughfare yet retaining sheltered ventilation and providing full internal cleaning facilities.

The windows open as a bottom hung vent for normal ventilation requirements and as a side hung vent for cleaning, the opening light being hung on semi-concealed ironmongery which allows alternative opening by the simple operation of a single handle. When closed the opening light is locked with a multi-point locking mechanism which is completely concealed.

Again this window is designed for single glazing, seal cavity double glazing, or coupled sash ventilated cavity double glazing. It is not restricted to one suite of ironmongery but is of course limited to the range of turn tilt gear available.

As with the Perma Pivot range the Perma Turn Tilt range also caters for top hung, bottom hung, side hung, fixed glass panels, or infill boarding within the scope of the basic sections and can also be arranged in curtain wall construction or manufactured in single units.

The air and water penetration tests on both Perma Horizontal pivot and turn tilt window shows no water leakage at m^3/hour/m. length of opening joint and both results show the windows to be well within the limits for the most severe category. □

The Perma Twin Tilt coupled sash, double glazed window

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INDUSTRIAL FORK LIFTS

The big lift makes work lighter

THE manufacture and sale of industrial fork lifts trucks is universally reckoned to be one of the most fiercely competitive markets in the world today. The global industrial recession, with its marked reduction in overall investments in new equipment of every kind, has hit the fork lift truck manufacturers particularly hard.

To use a well-worn phrase, there are too many fork lift trucks chasing too few buyers. It is, therefore, very much a buyers' market — which makes this an excellent time to consider purchasing new machines. Most will be quoted at extremely competitive terms and prices, for the majority of manufacturers are very anxious indeed to enlarge their share of the expanding, and lucrative, markets of West Africa.

There are literally scores of fork lift truck manufacturers throughout the world. Since the fork lift truck is, in basic design concept, a very simple machine most of the various competitive models are very much the same in both appearance and rated performance. There are, of course, many marginal differences — one model may have a road speed 1.25 kph. faster than its competitors, another may have a 0.25 m. greater height of lift or, perhaps, a turning circle tighter by 0.3 m.

Such differences, however, are small and although they may be of great value for some specific application (where, for example, an extra 0.5 m. height of lift makes a crucial difference to the economics of a high stacking operation) generally speaking they are not of compelling importance for the average user.

Thus the user is faced with a bewildering choice of competitive fork lift trucks, all looking very much alike, all with much the same rated performance, and all doing much the same job in much the same way. This leaves two main areas of competition. The first is obviously on price and delivery.

There are a great many cut-price industrial fork lift trucks currently on the world market, and it is reputed that a disconcerting number are being sold at (or even below) manufacturers costs simply to keep the factories employed. Clearly such a situation cannot continue for long — which means that these machines are now as cheap as they will ever be.

Although price is obviously important, it is not as critical as the second area of competition: reliability.

When a fork lift truck breaks down, and there is no ready replacement or alternative handling system available, then for all practical purposes work in the factory or warehouse either comes to a complete standstill or, at best, is seriously delayed.

In terms of overall factory productivity, therefore, a fork lift truck is no less important than an assembly flowline or a machine tool, and should thus be selected with the same degree of care that most executives exercise when purchasing these far more costly items of production equipment.

One way of whittling down the long list of fork lift truck manufacturers to a manageable size is to determine whether the routine maintenance and servicing of their respective machines is within the technical competence of locally available engineers and electricians; and whether the manufacturer has an after-sales servicing and spares stockholding organisation or agency in the country.

A number of leading fork lift truck manufacturers are now well established in West Africa and have quite extensive servicing — in some cases, assembly — facilities. Others, who are only just entering the market or sell only sporadically in West Africa, have no more than a limited sales agency, and can offer little in the way of service and spares back-up.

Continued

Lancer Boss frontlift stacking heavy steel ingots.

INDUSTRIAL FORK LIFTS

...inclosed carburettion system. If they ...to operate at maximum efficiency, ...G trucks *must* be adequately ...ntained, particularly when they are ...rking in confined areas where ...nous fumes — given out by a poorly ...ntained engine — could create ...ous problems.

The great advantage of the LPG ...ck is that it combines the power and ...ficiency of a petrol engine with the ...closed space' performance of a ...ttery electric machine.

Moreover, whereas the battery truck ...n only work for a limited period of ...me before requiring a recharge, the ...PG machine can work indefinitely ...thout power loss or overheating. For ...avy duty, continuous cycle double-...ift work inside factories and ...arehouses, therefore, the LPG fork lift ...uck is ideal.

Battery-electric

Battery-electric fork-lift trucks are the most versatile and widely used machines. Available in capacities from about 0.25 tonne upwards, they are the basic workhorse of industry, and although somewhat more expensive than internal combustion machines, are very cheap to run (using stored electricity drawn from the mains) and are able to operate with equal efficiency in both confined areas and in the open air. They are robust and reliable — and servicing them is usually within the technical compass of a competent electrician, although this can vary considerably from model to model.

One of the leading manufacturers of fork lift trucks in most categories is the British Leyland subsidiary, Coventry Climax Ltd. Last year the company took over the Conveyancer fork lift truck interests. Apart from extending the company's range and manufacturing facilities, it meant that Coventry Climax acquired a shareholding in the Lagos subsidiary Conveyancer (Nigeria) Ltd., which employs some 70 people. The company is, therefore, well placed to expand its share of the West African market.

The Climax-Conveyancer range of standard fork lift trucks and reach trucks consists of some 109 models and variations, in capacities from 907 kg. for the smallest electric truck to over 11.7 tonne for the largest diesel machine. The company is in the process of rationalising its range, and recently launched three new electric trucks of 1 tonne, 1.25 t. and 1.5 t. capacity, and two diesel machines of 2 t. and 2.5 t. capacity.

Stacking building boards with a Coventry Climax Universal Major fork lift.

Most fork lift trucks can be fitted with a range of general and special purpose lifting attachments, including a crane jib unit, for carrying loads that are difficult to handle with standard forks; various clamps for holding materials such as blocks, bales, pipes, poles, logs and boxes without pallets and without in any way banding or strapping the load; and a variety of hinged, rotating, and side-shift forks, the latter enabling the load to be positioned quickly and with great precision without repeatedly moving the truck.

Special purpose attachments are legion, and are often made to meet customers' specific requirements. One such attachment, which could well solve many problems in West African ports and quaysides, is the overhead container handling device fitted to a Climax-Conveyancer 10,160 kg. capacity diesel powered truck working at the Rotherhithe, London, depot of Container Storage Service (Camberwell) Ltd.

The attachment can accommodate containers from 6 to 12 m. in length and weighing up to 7 tonnes. It enables the containers to be stacked three high, increasing the utilisation of the 8-acre site by some 50 per cent, thus providing space for some 2,000 six metre containers.

Corrugated sheeting being handled by the International Harvester 2526 fork lift.

Similar top-lift attachments fitted to Lancer Boss fork lift trucks are used in the Merseyside berth of Liverpool Maritime Terminals for handling containers belonging to the UK/West Africa Line Conference plying the Lagos/Apapa-Liverpool route. Most of the 6 m. containers are stacked two high in closely spaced blocks of 24 units. Access is provided by a 13.7 m. aisle and by clear areas on the periphery of the storage zone.

The gangways between adjoining blocks are very narrow, seldom being more than 1.8 m. wide. Hence up to 700 six-metre containers can be stored on the 2 hectare site. Two 30-tonne capacity Lancer Boss trucks operate between the storage area and the quayside, travelling over a cycle distance of up to 366 m. and carrying loads that average 14.5 tonne per unit. In an 8-hour day they handle around 100 containers, an average of 9.6 units per machine per hour.

Most of the fork lift trucks produced by the major manufacturers are designed to withstand hard usage — none more so than the five 5-tonne capacity Lancer Boss low profile machines working inside a brick kiln at the Henry Foster Brick Co. in Bishop Auckland, UK. All the trucks are fitted with special clamp forks, and are used to carry and stack green bricks in the kiln and remove the fired bricks. Working conditions inside the kiln are harsh. The atmospheric temperature can be as high as 60°C and the floor temperature is frequently much higher. Under these conditions pneumatic tyres rapidly deteriorate, and the company is now experimenting with cushion tyres.

Brick dust is also a problem, and the truck engines are fitted with special high

Continued

INDUSTRIAL FORK LIFTS

ficiency filters. Each truck either loads or unloads 65 brick packs per day from the kiln. During the course of a year each machine handles about 7 million tons, weighing a total of some 24,000 tonnes — and travels nearly 4,000 miles, which is no mean achievement in such arduous conditions!

The fork lift principle was pioneered by the Americans, and many of the world's leading manufacturers are still American-owned companies. Typical of these is the Caterpillar Tractor Co., which in line with its plans to increase its sales in Africa and the Middle East, recently completed a £20 million expansion scheme at its main European factory in Leicester, UK. The new factory, which puts some 37,000 square metres under one roof, is three times the size of Caterpillar's previous UK plant, and is currently producing 25 different models, the majority of which will be exported — with West Africa singled out as the prime market.

Caterpillar has for many years been the world's largest manufacturer of earth-moving equipment, but entered the fork lift market at a very late stage — in 1965 when the company acquired the Towmotor Corporation, one of the leading US manufacturers of FL trucks. Since that time Caterpillar has considerably expanded its range and its share of the world market, using the resources of its international sales and servicing organisation developed over the years by its earthmover section. The Caterpillar range includes diesel, petrol, LPG and electric machines in capacities from one tonne to 13.5 tonne.

Italy is another major fork lift truck exporting nation, with a number of leading manufacturers, including Fiat. The Fiat range consists of some 59 basic models, including a range of electric machines with electronic control fitted to the drive and lift motions. This system substantially increases the speed and acceleration of the machines, making them ideal for work which involves frequent stops and starts. The road speed of the standard 1.2 tonne electric machine, for example, is 12 kph. laden and 13.5kph. unladen. The same machine fitted with electronic high speed motion controls has a laden speed of 16 kph. — an increase of 33.3 per cent — and an unladen speed of 17 kph.

A similar electronic system is fitted to Hyster electric fork lifts, and its benefits include stepless acceleration — an important consideration when positioning fragile loads such as bottles and glassware — and reduced battery consumption, thus extending the period between recharges.

Rated two tons at 20 inch load centres the Sambron J24S can lift up to 20 feet with a towermast.

Hyster is an American company which has become truly international, with no less than 15 factories throughout the world. It produces a very wide range of machines in capacities up to 37 tonne, and claims to have the largest research and development centre in the materials handling industry. This is the Hyster Technical Centre, where all prototype models and ancillary equipment are tested and evaluated, and which covers some 78 acres — large by any standard.

A Bonser D5000K undergoing pre-delivery tests. Exceptional stability and manoeuvrability, together with a number of design innovations are among features Bonser claim for the new truck which has a lifting capacity of 5000 kg. (11,000 lb.) at 600 mm. (24 in.) load centre.

At the smaller end of the scale the British company A. Hirst & Sons Ltd., of Dewsbury, manufactures the Forager range of small capacity battery electric trucks. The capacity of the Forager Ant pedestrian controlled machine is only 5 cwt. at 15-inch centres. Its maximum raised height is 10 ft. 9 in. and its width is a miniscule 2 ft. 8 in. It is a perfect little machine for small stockrooms and warehouses, where loads are comparatively light and access is invariably restricted. Using a standard 30 in. x 30 in. pallet, the maximum width for intersecting aisles required by this machine is only 4 ft. 2 in.

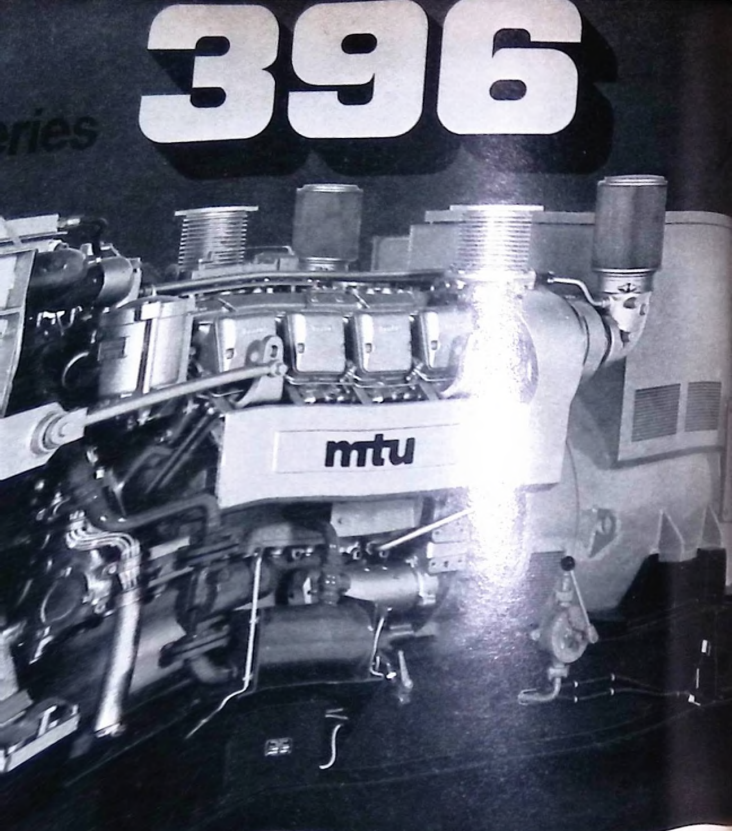
The company also produces a small capacity, driver-controlled machine of 0.59 tonne capacity, and several larger capacity pedestrian operated machines, ranging from 0.5 to one tonne. A key feature of these latter machines is ease of access for routine maintenance. The removal of a glassfibre cover gives immediate access to the main drive unit and the electrical control gear. Since the machines are in no way sophisticated, servicing them is well within the technical scope of any competent electrical maintenance engineer.

Exceptional stability and manoeuvrability, together with a number of design innovations are features claimed for the new high capacity industrial lift truck, the D5000K, which is now the subject of a worldwide sales drive by manufacturers Bonser Engineering Limited of Giltbrook, Nottingham.

With a lifting capacity of 5000 kg. (11,000 lb.) at 600 mm. (24 in.) load centre, the D5000K incorporates, as a standard feature, an integral sideshifting mast, which has none of the deration of lift capacity, normally found with sideshift carriage attachments.

A combination of matched components and a fabricated chassis is used in the construction of the truck to give good accessibility for servicing. The design profile gives a low centre of gravity making for excellent overall stability and all round visibility.

Although the entry of the Japanese into the fork lift truck scene came long after the establishment of most of the major Western manufacturers, they have nevertheless captured a huge share of the world market. One of the leading Japanese manufacturers is Komatsu, which produced its first fork lift truck in 1959. Today it has a complete range of machines from 0.8 tonne to 40 t. capacity, backed by a remarkably comprehensive range of standard attachments which, says the company, "are like many extra pairs of hands." □



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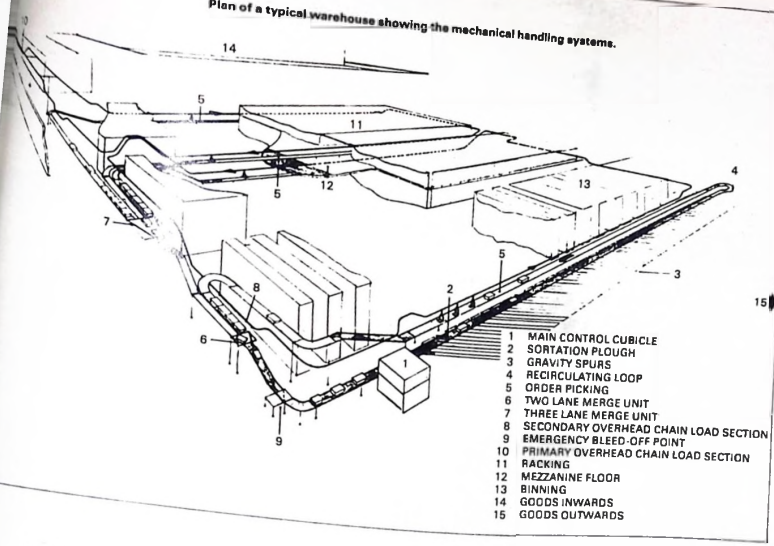
Plan of a typical warehouse showing the mechanical handling systems.



The Questions Which Really Matter when Buying Mechanical Handling Systems

by Mr. J. P. Blackford, Managing Director of Sovex Marshall Ltd.

BUYERS WHO buy mechanical handling systems are to be found in almost every industry, for whoever produces or distributes goods of any kind is faced with the need to move them about while he is actually producing them and after he has done so. This being so, trends within the mechanical handling industry are inevitably dictated by the developments taking place in all the other industries which it serves.

Those developments take many varied forms. In today's world they often show themselves as new products, new production technology, an ever-increasing scale of operation, the re-organisation of distribution into more centralised units, and the building of new plant complete with on-site handling, conveying and storage systems forming an integral part of its initial design.

The pattern of orders received continues to include small-scale orders which we welcome because they are a constant source of reliable income for us. Conveyor systems continue also to be built in existing buildings in circumstances which are sometimes far from ideal, but it is part of the challenge which the skilled mechanical handling engineer is pleased to resolve. Sometimes, the more restrictions there are on the space available, the more ingenious a system can result.

It is a feature of the really major suppliers operating within the industry that they are happy to service installations whether they be large or small, highly sophisticated or completely straightforward, and in order to be able to do this they must have some method of production which lends itself to this kind of flexibility.

In the modern world, large, purpose-made sysyems are installed more frequently than formerly. Conceived as part of either a major plant re-organisation or a large construction programme, they have acted as the demand which has led to the development of a compatible source of supply of the kind represented by my own company.

There are not many companies who are capable of providing the complete deal necessary for a contract of this kind — which involves the design, manufacture, installation, commissioning and servicing of major systems such as those now operating at some of the largest installations in Europe. How then is a supplier to organise his production and installation techniques so that he can service not only these big orders, but also the average manufacturer who wants a relatively simple handling scheme?

Time, space, money, control and safety

The mechanical handling industry produces nothing in itself. Instead, it devotes its energies to helping others to produce. Every installation is only a means to an end, and the versatility and flexibility of the equipment is of no value except when applied to the needs of a particular site.

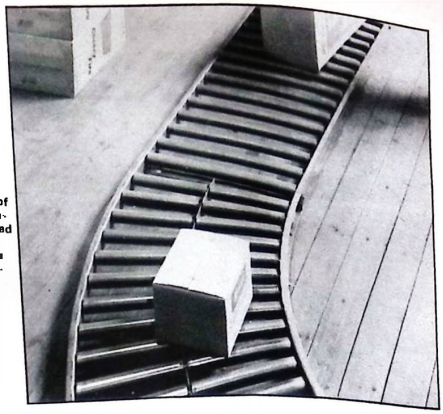
The customer is really investing his money in a system which will save his company's *time, space* and *money*. He can also expect expect some important benefits in

Continued

...of *control* and *safety*. These are ...and products, and it should be the ...of every handling and conveying ...tion to aim in these five directions. ...sign of every system must be tailor ...for the customer's very specific, very ...ical requirements.

...Certainly flexibility and versatility are ...ial ingredients of systems capable of ...ing these specific needs, but how are ...se attributes attained? Are they built ...ce standard equipment, or do the ...ers manufacturer offer some ...ning ...some hidden expertise which does ...appear in the catalogue?

...The range of standard products which ...a major supplier ought to be ...ge in ...may be complemented by a ...th of ...erience which shows itself only ...ute. ...Every supplier has his own ap...ch to ...ing this need. Sovex Ma...l, for ...ple, combines a comprehens... range ...standard products with unit p...duction ...niques and a high level ... custom ...ering expertise. However ... need is ...e must be able to carry th... stomer ...through the whole operati... from the ...when he first contemplates ...sting in ...sort of the system, to the day when ...system which meets his needs is com...ioned and functioning efficiently. Even ...servicing back-up is vital.



The gravity roller conveyor is available in single lengths or as part of a complete installation. It can be linked with powered system, and offers low capital investment and low running costs.

A guide through the maze

Our hypothetical customer will ...mediately find himself faced with a ...ewildering array of competing systems ...and equipment, which has the effect of ...eaving him confused rather than ...enlightened. To clear away the mist, to help ...guide him through the maze, he needs ...advice of the right kind.

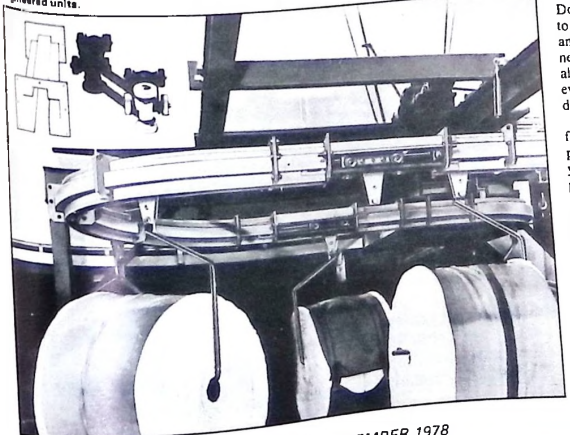
I submit that the person best able to provide it is the engineer who has been involved extensively in innovating into many different industries and on many different sites, each presenting a different problem. This is so particularly because the advice needs to be extended beyond the selection of particular items of equipment to include an element of planning and design which may involve some unanticipated change which nevertheless brings immediate benefits. This may be the re-routing of production lines or the transfer of a conveyor to near ceiling height so as to leave a gangway or a production area free. It might even involve knocking a hole in an intervening wall and directing a conveyor through an enclosed tunnel over a roadway into a building on the far side.

It will be clear that what I am talking about here is a complete consultancy service appropriate to the size and sophistication of each individual installation. Can your supplier provide this?

Today's conveyor carries goods with 100% efficiency — which is, after all, their main function — and it should be understood that the real sophistication of today's best system lies rather in the use made of ancillary equipment to create the over-all design capable of meeting site needs in their entirety.

I am speaking of, for example, devices for transferring goods from one conveyor to another conveyor of a different type; automatic loading and unloading mechanisms; the queueing facility built into some equipment; and the special safety features incorporated for any one of various reasons.

The Series 800 overhead chain conveyor is a versatile heavy duty system made from a series of strongly constructed precision engineered units.



From the general to the specific

I have outlined some of the general considerations. Let me now be quite specific in enumerating some of the questions which you must ask yourself (and your supplier) in order to ensure that you are obtaining the best deal possible.

Do you honestly know what you want? Does your mental picture of what you want to correspond with what you could have and what is available, relevant to your needs? Have you really investigated the alternatives available? Have you, before even beginning to think about equipment, defined your objective?

Does that objective take account of factors like the weight and shape of the products to be handled, the complexity of your manufacturing process, the geography of the building in which the system is to be installed, the maximum load (both per unit and over-all) which it will be expected to carry, the money available and the expected return once the system is functioning?

Remember that a handling system does not necessarily have to travel along existing production lines. Really versatile systems will do things like travelling horizontally, vertically, at any angle, around any curve, at variable speeds, at different temperatures, and very quietly.

Continued

...may also incorporate features such as ...matic pre-selection of discharge points, ...off units and merge units.

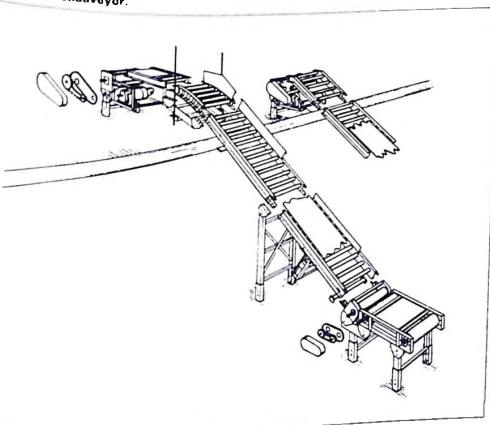
...ailable categories ...conveying systems

...What are the different categories of con...ing systems available to the customer? ...someone who has never invested in a ...ing system and he will certainly ...mmon belt conveyors, and probably ...er conveyors as well; but will he realise ...many other types are on offer, any one ...which may be far more suitable to his ...eds?

...Swan Marshall *alone* offers a range ...ich includes complete engineered ...ems, printing and publishing industry ...ipment, baggage and freight handling ...ipment, document handling systems,

A Swan Marshall belt conveyor, used here to carry lithographical porcelain pieces.

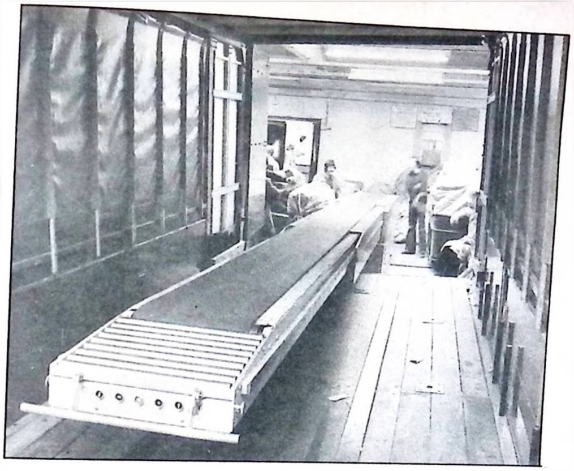
...belt conveyors, roller conveyors, powered ...corner conveyors, accumulating con...veyors, telescopic conveyors, mobile con...veyors, overhead chain conveyors, chain ...and slat conveyors, and all manner of



To facilitate the efficient, rapid loading and unloading of a daily average of about 6,500 mail bags weighing between 15 and 20 kgs. into and from containers and vans, is this fully cantilevered TLB extendaveyor.

custom engineered equipment. Within these categories there are several different items.

Let us take from this list a single example: belt conveyors. Immediately, a relevant question to be asked of a supplier offering conveyors of this type is: in how many different ways can it be assembled? At floor level, for example? Or suspended? Or fixed at any height? Will it travel up, down and in reverse? Can it cope with two-way traffic? Is it easily linked with other equipment in the same company's product range? Or existing equipment perhaps manufactured by some other supplier? What belt widths are available? Is there a choice of belts? What types? Is there a belt surface suitable for the loads to be carried? Food quality belts, for example What loads will the conveyors carry per unit length and over-all? Will they run at fixed or variable speeds? Is a light duty version available? Are the conveyors economic to install and maintain? Can they incorporate special



The Masterveyor unit belt conveyor as it might be assembled for an inclined application. It can be assembled in an almost unlimited number of ways at floor level, suspended or fixed at any height.

attachments? Can they be extended when required? Can they negotiate curves? Can they carry loads round right curves while retaining the loads securely? Are suitable guards provided? Are they safe to use?

This list can be carried on for some time. It can then be multiplied out for each category of conveyor and each item within each category. I think it speaks for itself as an example of the kind of list of questions which need to be asked.

My own company adopts an approach (and there are others) based on a comprehensive family of inter-related and interchangeable equipment. Standard products and components are manufactured and assembled into circuits always different from each other. Wherever this range of standard equipment does not meet a customer's special needs, special equipment is devised to surmount a special problem — though even this will include standard components wherever possible.

Choose the right system for your needs

You do not need a superb, highly versatile handling system at all. What you *do* need is the *right* system for your special needs. In today's economic climate, this is nothing less than critical. Moreover you should always have an eye on tomorrow. Can your system be extended to meet tomorrow's requirements — about which you can only guess? Can it be modified for the same reason?

These are very pertinent, very practical questions. A supplier who can provide all the ancilliaries which, together with the conveyors themselves, make all the difference between an adaptable system and a complete full stop. □

...reversing ...

...crete mixer

...reversing drum concrete ...designed to meet the ...s of the big builder in ...ing a wide range of high ...concrete at a fast rate, ...been introduced by ...rick Parker Ltd.

...known as the 'Hy-Mix-...The mixer is mechanically ...and has a batch capacity of ...cubic yards unmixed and 400 ...mixed.

...air-cooled 13.8 hp diesel ...is equipped with tandem ...ydraulic pumps, operates the ...mixer and drum and, with no ...belts or mechanical gear ...to bother about, ...maintenance is kept to a ...minimum.

A single lever controls the mixing and discharge rotations, and all controls are grouped together in a convenient position to give the operator a clear view of the loading and discharging operations.

Should hydraulic motor maintenance be required the complete unit is easily removed from the machine without disturbing the mixing drum.

The loading hopper, strongly reinforced along its lip, is raised and lowered by hydraulic ram. The steep angle of discharge combined with a streamlined shape gives a rapid and clean feed.

The steel main frame is panelled to give adequate safety guarding and a smooth surface for easy cleaning while the four wheel under-carriage has a three point suspension for easy movement. For further information contact **Afrotec Technical Services (Nigeria) Ltd,** Isolo.

Hyster's J25-35A series

The new **Hyster** three wheel Electrics — designated the J25-35A series — are the result of six years exhaustive research, development and testing.

Hyster's J25-35A series comprises three models, with capacities of up to 1 750kg. Designed for operational flexibility, these trucks offer outstanding manoeuvrability and increased performance — factors which contribute towards making these trucks amongst the most productive on the three wheel electric market today.

Hyster's J25-35A series has been designed to save the customer time and money. One of the principal features of the trucks is outstanding manoeuvrability. The Hyster three wheel Electrics have exceptionally good manoeuvrability. This is the result of the skilled integration of a very compact drive unit, unitised frame and steering trunnion. PROCONTROL, proportional control system, also makes an important contribution to the manoeuvrability of the trucks, by giving very precise steering control. Consequently, Hyster's three wheel Electrics allow maximum utilisation of expensive warehouse storage space — stacking aisle widths can be kept down to a minimum. For further information contact **NMI Ltd.**, Apapa, or **O.A.C.** in Monrovia.

CP breaker with high power to weight ratio

A new medium duty lightweight demolition tool, the CP1210, has been introduced by the **Consolidated Pneumatic Tool Company Limited, Equipment Division.**

In its design, the Company has paid special attention to achieving a particularly high power to weight ratio. This has resulted in the production of a machine which, weighing only 19.05 kgs., is claimed to be capable of undertaking many of the duties normally requiring heavier class breakers.

The CP1210, which is available in standard and noise suppressed versions, has been countoured for operator comfort, while resilient spring loaded latch retainer reduces shock loading. An improved type of throttle enables the tool to be eased into the work until full power is needed, so improving directional control.

The tool incorporates a reversible piston working in conjunction with a fast action valve, and features a 4-bolt heat-treated backhead assembly designed for improved cylinder sealing and increased overall efficiency. A large capacity oil reservoir forms an integral part of the tool, providing constant lubrication to the piston and other moving parts.

A new range of PAL Scaffolds

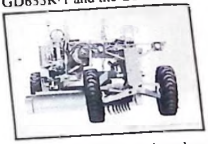
A new product has been announced by **Entrepose TP,** a component of adjustment which is adaptable to the Entrepose propping towers and allows to compensate the differences of levels from 0 up to 1,050 mm, while it is still possible to make a finish adjustment by means of head jack-screws or adjustable base-plates.

This accessory enables a speedy operation, without calling in the engineering department's assistance to carry out plans "to the millimetre". It also enables to meet all unforeseen contingencies on site, which should be solved immediately (catastrophic wedgings, ground deterioration, etc . . .) without modifying the initial composition of the towers.

Moreover, its important stroke in height (1.20 m, the head jack-screws being included) allows to remove easily the towers under slabs when it is necessary to pass under the web of long span girders, without being obliged to dismantle the tower uppest part which supports the formwork. Presently this material is the only one which presents this advantage and the only one which can be adapted to triangular towers.

New models from Komatsu

Komatsu has expanded its versatility in motor graders with seven new models. These seven new machines bring the Komatsu motor grader line to a total of 11 models. The new motor graders are: GD500R-1, GD600R-1, GD605R-1, GD605A-1, GD650R-1, GD655R-1 and the GD655A-1.



The GD500R-1 is based on the GD310RC but with much improved operational performance. The machine has a 125 flywheel horsepower (93 kW) Komatsu engine and utilises many parts interchangeable with the GD37-6H. Standard equipment on the GD500R-1 includes hydraulic power steering and chain-type tandem drive, adjustable control console and tiltable steering wheel, and a safety valve that helps prevent dropping the blade accidentally. The clutch, sliding mesh-type transmission, final drive, steering system and several other parts are interchangeable with the GD37-6H. For further information contact **Komatsu (Nigeria) Ltd,** Lagos, or **Montraco** in Monrovia.

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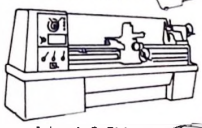
Colchester lathes from 20" to 120" centres.

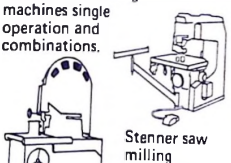


Adcock & Shipley milling machines horizontal universal and vertical.

Fobco drilling machines from half inch to one and a quarter inch.

Woodworking Machinery

SCM wood working machines single operation and combinations.

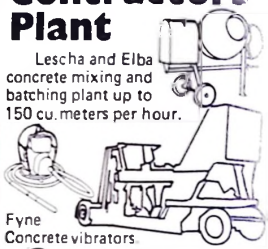


Stenner saw milling equipment

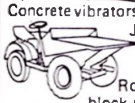
Jones and Shipman surface cylindrical/tool and cutter grinders.

Contractors Plant

Lescha and Elba concrete mixing and batching plant up to 150 cu. meters per hour.

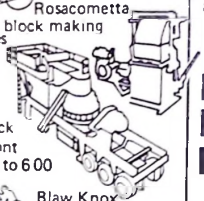


Fyne Concrete vibrators.

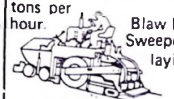


Johnson dumpers one to two tons

Rosacometta block making machines from 1000 to 12000 blocks per day.



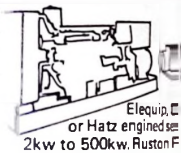
Pegson Rock crushing plant capacities 4 to 600 tons per hour.



Blaw Knox Sweepers. Pavers for laying asphalt up to 8m.

Phoenix full range of Bitumen equipment and chipping spreaders.

Generato



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Exposure to direct sunlight in ...h areas can result in surface ...peratures well in excess of ... deg C which means that, ...less protected from solar ...ation the equipment will ...ed to be derated by at least 25 ... cent. Without adequate ...ading, therefore, it is ...essary to install larger and ...more expensive motors. Use of ... shades is thus a cost saving ...ercise.

Those in use at present are ...erally purpose built; the ...tsman Plastics products are ...modular construction so per...ting sun shades to be ...plied to suit most needs in ...matter of size and shape.

New terex 72-61 loader

General Motors has announced the introduction of a new ...acteration front end loader, the ...42 to 4.6 m³ 72-61 from its ... General Motors Luxembourg ...ant at Bascharage.

Power for the 72-61 is ...pplied by a Detroit Diesel 8V-...T engine which produces 229 ...V net power to give excellent ...akout force and rimpull ...aracteristics. A "vaneless" ...bocharger complements the ...onsive 2 cycle engine and ...ntains rated power to 3 000 m or in high ambient temperatures with the additional benefit of quieter, cleaner exhaust and better fuel efficiency.

...ansmission is a remote ...unted Allison "Soft Shift" ...T ...1820 with four forward ...and four reverse speeds. Twin ...e design reduces driver ...ort by providing an ...matic shift between low and ...turbine for fast digging and ...ing cycles. "Soft Shift" ...ions shock loads when ...ging from forward to ...erse.

A new design lift arm ...anism combined with an ...ient hydraulic gear pump ...ovides the 72-61 with a ...perior breakout force of 174 ...N — exceptional in the 4.2 m³ ...lass. For further information ...contact **Blackwood Hodge (Nigeria) Ltd**, Apapa.

Extendible semitrailer

The **Goldhofer Fahrzeugwerk GmBh** System "SKPH" comprises extendible semitrailers with hydraulic suspension and hydraulic steering. The detachable rear bogie allows combinations of semitrailers or drawbar trailers up to 200 tons payload.

The picture shows transport of a railway bridge section weighing about 70.000 kg and measuring about 26 meters in length and 5.6 in width.

2000 series power tools

Atlas Copco is now launching the 2000 series, a complete range of power tools for light industrial applications in maintenance shops, in woodwork and housebuilding industries, where the operators are often expected to perform a number of different tasks. The 2000 series of specially selected power tools is ideal for intermittent jobs, such as drilling, grinding, filing, polishing, chiselling, bolting or engraving.

The series compliments Atlas Copco's established range of

heavy duty power tools: Each machine is, of course, supplied with the necessary accessories: chuck, support pad, handle and safety guard for power grinders. In addition, there are optional extras, suited to each machine and to specific jobs.

As the 2000 series is designed for the international market, Atlas Copco has developed an ingenious system of symbols, giving clear instructions for use. Technical date and installation hints are also provided on the package cover. For further information contact **R T Briscoe (Nigeria) Ltd**, Apapa.

Bulk tankers for bitumen

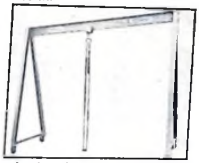
Latest in a series of new designs developed by the Special Tankers division of **Whale Tankers Ltd**, are insulated and heated tankers designed specifically for carrying bitumen.

Intended to carry bitumen from processing plant to a seagoing tanker terminal with minimum heat loss from the load in transit, the tankers have a deep layer of insulating material and external aluminium cladding around the conventional mild steel tank. An internal heating coil is incorporated, designed for use with a mobile steam generator, and a special type of heated outlet valve is fitted at the lowest point in the tank.

Demountable Gantry

A demountable gantry introduced by **Pelloby Engineering Ltd** has a lifting capacity of up to two tonnes, can be erected by one man in under half an hour and easily transported from one location to another either as a complete unit on a vehicle or manually in knocked-down form. The heaviest section — the main load beam — weighs only 50 kg.

When disassembled, the gantry comprises only nine parts, including the hoist block. Its simple nuts-and-bolts assembly calls for no special skill. On the standard model the beam span between the two legs is 3.35m with a height of 3 m from the underside of the beam to the ground. Alternative versions can be supplied with beam spans of up to 4.25 m and beam-to-ground heights of up to 3.65 m.



In knocked-down form, all the gantry's parts fit into a compact package measuring approximately 300 mm x 300 mm x the height of the main load beam — a feature designed to facilitate transportation by land, sea and air. Total weight of the gantry is about 140 kg. Industrial applications range from lifting duties in factory work-shops and loading/unloading vehicles to lifting submerged pumps from wells.

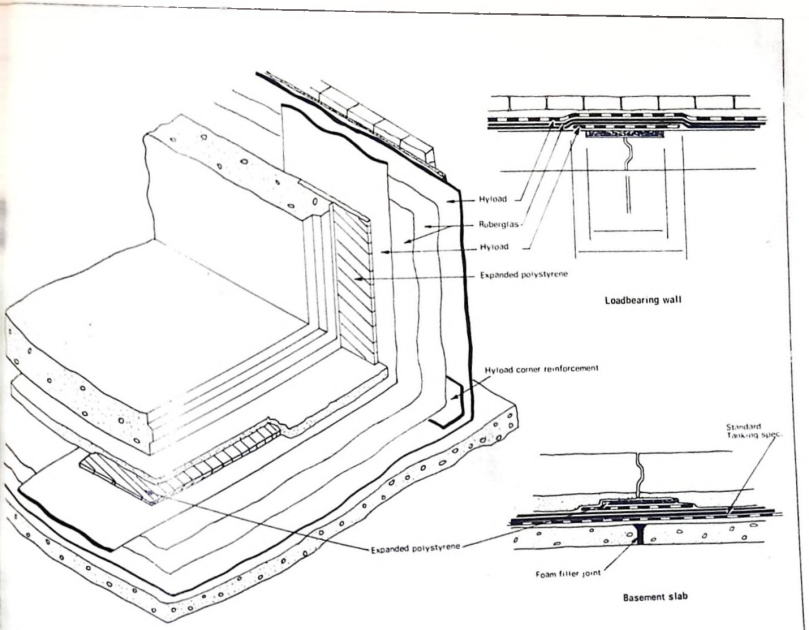
Gopher 625

To ensure operator comfort and to broaden its material handling capabilities **RayGo Inc.** offers its Gopher 625 with an all weather ROPS cab and a .849 cu. m. capacity light material bucket.

The ROPS cab includes sliding rear window, heater, fan and windshield wiper. Excellent all around visibility, easy access and comfort are the main features of this cab, RayGo claims.

The ruggedly constructed light material bucket is designed to handle a wide range of materials like manure, wood chips, fertilizer. For further information contact **Afrotec Technical Services (Nigeria) Ltd**, Isolo.

More information may be obtained on any item by using the form facing page 214



A detailed cross-section of an expansion joint.

TANKING TAKES A HIDING

With relatively high water tables, the importance of tanking of structures in West Africa cannot be overstated. R. L. Bonafont, General Manager, Research and Development for Ruberoid Ltd., describes the advantages of high quality non-extrudable membrane systems.

THE ENGLISH language has many words which have two or more quite different meanings — "hiding" is one example meaning either "out of sight" or the equally acceptable, and more colloquial, "a physical attack". The title is intended to convey both meanings.

Tanking is generally applied to the outside of subterranean structures where it not only cannot be seen, but also is likely to be subject to permanent hydrostatic pressure and attack by soil acids and bacteria. The tanking system is generally located in an inaccessible part of the completed structure. The cost of local repair subsequent to completion is therefore very high and general reinstatement of the system virtually impossible. The materials and methods of construction for tanking must therefore be of the highest quality and workmanship. And these requirements are best fulfilled by a really tough non-extrudable membrane system fixed with hot bitumen, such as Ruberoid's Hyload system. It will be appreciated also that these conditions are doubly important when considering tanking systems for West African construction projects, particularly in coastal areas.

Traditional tanking methods include either the application of mastic asphalt or a bituminous membrane system to the surfaces concerned. The general requirements in respect of the design and finish of the structure, waterproofing protection and other pertinent matters are common to both asphalt and bitumen sheeting systems.

Building movement

The principal weakness of mastic asphalt is its relative inability to accommodate unanticipated building movements. If the structural surface to which the mastic asphalt is applied developes a surface crack as a result of shrinkage or building settlement, the crack will be propagated into the asphalt unless adhesion between the asphalt and the surface is weak enough to bring about a stress relieving delamination at the interface.

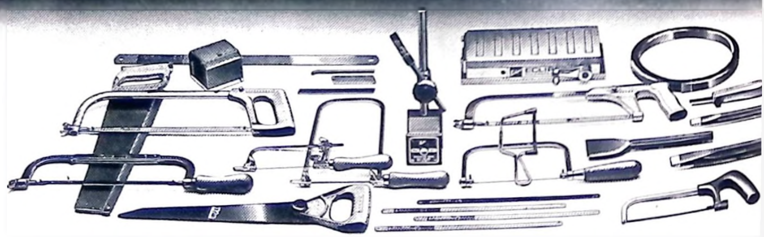
Once a fissure develops in the asphalt, the risk of propagation through its entire thickness is high because there is normally no tensile reinforcement to arrest cracking, and the crack itself gives rise to high local stress concentrations which tend to weaken the layer of asphalt.

Although there is less risk of tanking rupture with properly reinforced or prestressed structures, there is still the possibility of fissuring. Shrinkage movement depends to a large extent on quality of the concrete and positioning of the reinforcement — both of which relate to supervision and workmanship on site.

On the other hand, conventional bituminous sheeting tanking systems offer

continued

SKILLED HANDS DEMAND QUALITY TOO



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movement capabilities than mastic But, even so, their strain ities still leave something to be Furthermore the soft bituminous used in tanking applications are to extent vulnerable to flow under ature or high pressure if not fully con- by the structure.

High safety factor needed

It will be appreciated that the harmful ses to which tanking may be subjected virtually impossible to assess ately, and bearing in mind the ulties of access for repair already ered, a high factor of safety mem- ane performance is desirable. And use of the difficulties of forecasting rmful effects, it is essential to allow for ntuality by specifying a high quality rane system.

Pressure problems

Hydrostatic pressure is, for example, the most significant factor of all. Unlike walls which need to be protected only against slowly rising damp, or roofs which are subject to intermittent rain, tanking may well be required to resist water indefinitely — and not merely water, but water under pressure.

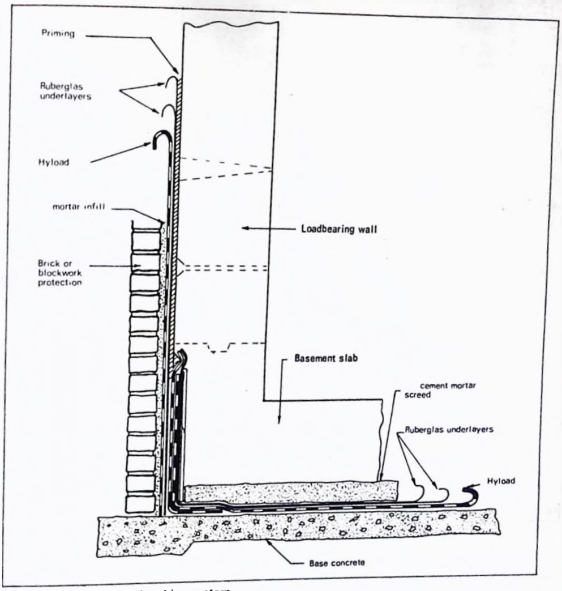
The application of an impermeable barrier to such pressure may not sound too difficult; indeed if the wall face was really smooth, solutions to the problem would be relatively simple. The significant point is that when the tanking has its back to the wall, so to speak, and is having to resist the hydrostatic pressure of the surrounding soil, it will fail unless fully confined and backed by a solid, load bearing surface.

But the wall face will inevitably have irregularities forming voids which are all potential danger points. Voids can be formed by honeycombing, steps or discontinuities at daywork joints — all creating points where membranes are liable to extrude or fracture.

A tanking system such as Ruberoid's Hyload meets both requirements. It is rugged and non-extruding and the hot bitumen with which it is applied fills the interstices and minor irregularities of the supporting surface. Thus the waterproofing membranes have a firm and continuous backing from which to resist the hydrostatic pressure.

The possibility of cracks occurring from unanticipated building movement also has to be considered. A strain of even 3 to 4 per cent will transfer an intolerable strain on any semi-rigid waterproofing, or indeed on any material which lacks the right degree of movement capability.

Non-extrudable membrane tanking systems have the necessary ability to withstand exceptional building movement. Typical of these, Ruberoid's Hyload E



Detail of a hyload typical tanking system.

system comprises an inner layer of Hyload or Ruberglas sheeting and an outer of Hyload; as the expected hydrostatic pressure increases, greater thickness of Hyload E is specified. The inner sheet is bonded to the structure and each successive sheet is bonded to the previous sheet with hot bitumen.

Hyload E is a composition of pitch, rubber and other additives reinforced with natural and synthetic fibres, while Ruberglas is a glass reinforced bitumen sheet with a performance considerably in excess of the requirements of BS 747: 1968 for Class 3B bitumen roofing felts. It differs in the weight of glass fibre reinforcement, thereby providing substantially improved mechanical and physical properties.

Sealing critical points

The Hyload system also has the advantage of incorporating special components designed to ensure membrane continuity at corners which otherwise can be extremely vulnerable to stress in sheeting tanking systems. The components are standard units preformed in the factory from Hyload sheeting and known as cloaks. They remove the need for complicated cutting and lapping of the membrane on site thus ensuring the complete sealing of the system at critical points.

Designed to fill all the requirements of an ideal system for use where a high safety factor must be allowed for, the Hyload tanking system has all the capabilities likely to be demanded of tanking for any type of building structure. It has the necessary strength to act as an impermeable and permanent barrier to water under pressure, the necessary extensibility to accommodate normal structural movement, the right composition to resist chemical attack from ground water, soil acids or bacteria, ruggedness to minimise risk of damage during installation and fixing procedures in accordance with BS Code of Practice 102 "Protection of buildings against water from the ground" — all combining to ensure that the membrane system will function effectively throughout the life of the building.

Cost of inadequate specification

On most sites future access to tanking may be difficult or even impossible. There can be no regular maintenance programme. If the tanking fails at any time during the lifetime of the structure, either because of inadequate materials or through unsatisfactory methods of installation, the cost of reaching it — apart from the expense of the repair itself — can be almost prohibitively high in comparison with the small extra cost of specifying a system with the necessary factor of safety in the first place. The highest standards of materials, detailed design and workmanship are essential for successful tanking.

This article is not meant as an extensive coverage of the subject of tanking, but more as an indication of the factors to be considered when considering the type of tanking system to use. Excellent treatises already exist based on Ruberoid development work and copies of reports which have become standard reference works are freely available. □

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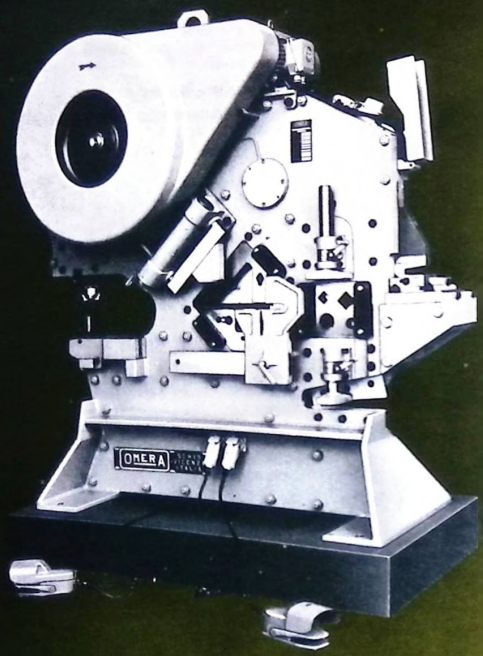

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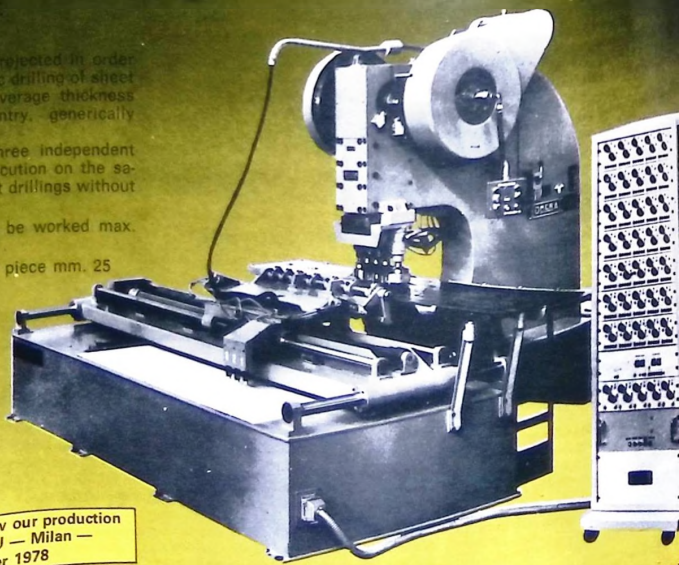
They are made in a range of ... sizes, and are able to meet ... request of use for all little, ... and great metallic carpentry ... jobs.

Machines, of great performances ... able to make different workings ... have a high working speed ... strong overdimensioned frame, ... allows their use, at the highest ... performances, for a long time with ... safety margins.

AUTOMATIC PUNCHING MACHINE WITH PROGRAMMABLE PANTOGRAPH

This machine was projected in order to make an automatic drilling of sheet plates of big and average thickness for metallic carpentry, generically speaking.
The machine has three independent punches for the execution on the same piece of different drillings without tool changing.

- Sizes of piece to be worked max. mm. 1300 x 600
- Max. thickness of piece mm. 25



are going to show our production to the 11th BI-MU — Milan — 7/14 October 1978

PUNCHING MACHINE-DOUBLE HOUSING MODULU...

READING

INJECTION MOULDING GIVES HIGH INCREASE OF PLASTICS OUTPUT

THE INJECTION moul[illegible] was originally developed in Germ[illegible]y about 70 building small hand pr[illegible] produc-ing pieces of only a few gram[illegible] cellulose acetate and later on of polyst[illegible]ne. Strik-ing developments in the cons[illegible]on of the processes took place after 19[illegible] first with machines operated by sc[illegible]ate water powered hydraulic units. Aft[illegible] the second world war the machines u[illegible]rwent the most radical transformation[illegible]nd the most important improvements in order to meet output of manufacture in quantity and quality requirements much higher than in the past and steadily more exacting.

Table 1 World production of plastics in the last fifty years.

1925	80.000 tons
1935	200.000 tons
1939	300.000 tons
1951	2,000.000 tons
1954	2,500.000 tons
1957	4,800.000 tons
1960	6,200.000 tons
1963	10,300.000 tons
1966	16,300.000 tons
1967	18,500.000 tons
1969	25,500.000 tons
1970	28,600.000 tons
1971	30,400.000 tons
1972	33,000.000 tons
1973	35,000.000 tons
1974	38,000.000 tons
1975	40,000.000 tons
1980	150,000.000 tons (estimate)

Quick survey of quantities consumed

Without attempting to make a detailed list of applications, which moreover would be impossible considering the vastitude, we shall make a quick survey of the quantities consumed by the most important fields of use in Italy, where over 2.170.000 tons of plastics are produced yearly (1975 data). Particularly in some of the sectors of the moulding industry injection has an high rate of incidence.

494,000 tons are used for packaging, which is the sector accounting for the largest quantity of polymers; 179,400 tons are used in building; 117,500 tons for the manufacture of household electric appliances, radio and TV sets; 112,000 tons for furnishing; 67,000 tons for the automotive and road transport industry; 61,800 tons for agriculture; 44,400 tons for the production of electric cables and telephones. The remaining 452,000 tons are absorbed by other minor fields.

The plastics industry is destined to uphold its role of first magnitude in the world economy, both for its dimensions and for the quality of its highly sophisticated services, irreplaceable in a civilisation of high technological content such as ours.

Main process for thermoplastics

Injection moulding is the main process used for processing thermoplastics. Almost 25% of these materials are injected and this process will always grow more important, considering the vast range of possibilities of use offered on account of the steady technological progress that will positively further evolve in the future. In line with this processing progress the following terms are used specifically today:

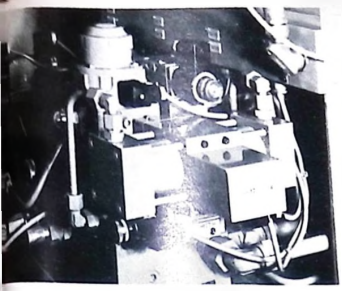
INJECTION MOULDING:

STANDARD — when dimensional tolerances of around 1% can be accepted for the moulding items;

ENGINEERING — for moulded items when dimensional tolerances are not exceeding 0.6%;

PRECISION — for moulded items when dimensional tolerances are not exceeding 0.3%.

The selection of the plastic materials is of the utmost importance. For standard moulding there are practically no problems and the materials most used are: standard and shockproof polystyrene — ABS — polypropylene — low and high density polyethylene — polymethylmethacrylate — polyvynil chloride.



The new VCU (variblock control unit) system fit on all injection moulding machines of the new series Tekonika of Metalmeccanica Plast. It permits the regulation and the control of pressures and of speeds.

Knowledge of noble plastics necessary

For engineering and precision mouldings including micromoulding a good knowledge of the properties of noble plastics, and specifically engineering plastics, is necessary: polyamides — acetalic resins — polycarbonates — polystyrylene — polytetrafluoroethylene — polysulphones — thermoplastic polyesters.

When planning the production of engineering and precision articles it will be useful to make a more thorough examination of the properties of the materials (on the basis of tables and technical documentation provided by the suppliers) as regards mechanical properties, flow curves, temperatures, electrical characteristics, behaviour in contact with chemical agents, dimensional stability in low thicknesses, abrasion resistance, etc.

How to warrant first rate production

The correct selection of the material, the well conceived construction of the moulds and above all the choice of the appropriate injection presses warrants a first rate production and high profits.

Italian industry is in the front line of the injection moulding machines construction, always more corresponding to the development of plastics.

On the basis of modern operating technologies an up-to-date injection moulding machine should have the following indispensable requisites:

- — high operation safety;
- — sufficiently high potentiality, perfectly suitable to the items to be produced;
- — flexible machine control, not complicated, with possibility of easy movements;
- — minimum necessity of personnel for the working and the maintenance;
- — proper protection against accidents and minimum noise development;
- — variety of technological possibilities;
- — high precision in the cycle repetition and steady working of the machine;
- — short starting times and replacement of the moulds;
- — high reliability control equipment.

Selection of machines

Considering the extensive range of possible processings the users must have the possibility of selecting between machines with electro-mechanical control (relay), machines with electronic controls (printed circuits), and machines in the version SUPER (with proportional electronic controls, designed for production of items requiring high plasticizing capacity and particularly fast movements), suitable to mould even quite dissimilar items as regards geometrical forms and composition of raw materials. □

COMMERCIAL VEHICLE — BLOMATIC

Far more than a load-carrying truck — that is the claim for the Swedish-designed Blomatic equipment now being offered in Nigeria by Associated Industries Sweden AB. The basic vehicle and its versatile application are described by Alan Bunting.

Bodies can be raised to a height of 1.4 m — compatible with most loading banks.

IT HAS long been realised that a commercial vehicle with front-wheel drive offers scope for design ingenuity in what is normally the load-carrying part of the chassis. With no transmission components — prop-shaft, differential or axle half-shafts — intruding behind the cab, the rear wheels can be outrigged on independent side members.

A number of manufacturers in Germany, France and the UK offer conversions of this sort on fwd vehicles like the Mercedes L206/306 and Peugeot J7 as well as on four-wheel-drive machines such as the Land-Rover and Mercedes Unimog. In the case of 4wd vehicles, some of the original traction capability is obviously lost by cutting out the drive to the rear wheels. And the remaining fwd configuration may not be wholly satisfactory for long-distance working.

Mercedes L306 most popular fwd chassis

Perhaps the most popular fwd chassis for such conversions is the Mercedes L306, rated at 3.5 tonne gross. The Swedish company AISAB, (address: Bergtorpsvägen 68, S-183 64 Täby, Sweden) uses the diesel-powered L306D as the basis for its Blomatic transport system, first introduced in 1976.

Behind the cab the conventional chassis frame is replaced by an elevating mechanism not unlike the mast of a fork-lift truck. The lifting carriage is fitted, not with pallet forks however, but with a pair of 1300 mm.-long stub arms, each forming the forward part of a chassis sidemember.

Bodies up to 1900 mm. wide are "straddled" by the sidemembers. A body — of boxvan, flat platform, dropside or almost any other configuration — can be picked up from, and parked at, ground level. Thus the Blomatic offers all the benefits of a demountable — or "swap" — body system with the added facility of ground level loading.

Body can be raised 1.4 m above ground

Furthermore the Blomatic lifting mechanism is able to raise the body (whose base-frame must be designed for compatibility with the system) much higher than the normal travelling position. In fact, there is enough travel in the "fork-lift mast" to give 1400 mm. ground clearance below the body. This enables the 3.5 tonne gross vehicle to back up to loading banks built primarily to suit larger and heavier trucks.

A word about the geometry of the sidemembers: each one is pivotted in the vertical plane so that when the forward-section stub arms (which remain essentially horizontal) are raised, the rear sections, on which the rear wheels are mounted, move like the trailing arms on some independent rear suspensions, adopting a progressively steeper angle with the horizontal.

This is best illustrated by the fact that, as the mechanism is lifted, the wheelbase is reduced. The shorter version of the Blomatic has a "nominal" wheelbase of 3,400 mm. in the travelling position. But as the sidemembers "fold" in lifting the body, that dimension comes down to something like 3,000 mm.

The short version can accept bodies up to 3,500 mm. long; the longer (nominal 3,920 mm. wheelbase) model is built for handling bodies of 4,150 mm. maximum length.

A single vertical hydraulic ram on the vehicle centre-line immediately behind the

Continued

In transit normal ground clearances are maintained.

wered to ground level for loading or demounting.

Ready to pick up ... the Mercedes-based Blomatic bas... vehicle.

e lifting power for the ent. It is fed from an power-pack with a push- on the end of a wander- socket inside the cab. raulic cylinders, one in ling arm, are actuated They serve as com- nd shock absorber ical lock holds the travelling position ing driven on the

rearwards between the pivotted trailing arms.

Bodies can, of course, be pre-loaded, as with any demountable system, so that vehicle turnround is streamlined and the chassis (and driver) are kept fully employed, while loading/unloading is in progress. This reduction in idle time also implies fewer chassis for a given volume of freight, with a body-chassis ratio of two or more.

The system also enables different kinds of body to be carried by the same chassis — a particular attraction for public authorities responsible for transporting a variety of goods and/or passengers. Hospitals have shown a particular interest in the equipment, reports AISAB. Blomatic body base-frames can serve as the basis for simple bus bodies (each holding up to 19 passengers), site offices, field workshops, temporary sleeping accommodation for work crews, and market stalls, as well as conventional load-carrying vehicle bodies. And modules can be linked together in multiples to form larger units.

At ground level, with a loading height no more than the thickness of the floor structure, a Blomatic body can be easily entered by the disabled — on foot or in wheelchairs. Similarly items of wheeled plant, typically battery-electric pallet trucks and manually-pushed stillages, can be rolled aboard without cumbersome ramps or dock levellers.

Unladen weight of the Blomatic vehicle, without body, is 1,950 kg., which means that it can lift and carry laden bodies weighing up to 1,550 kg.

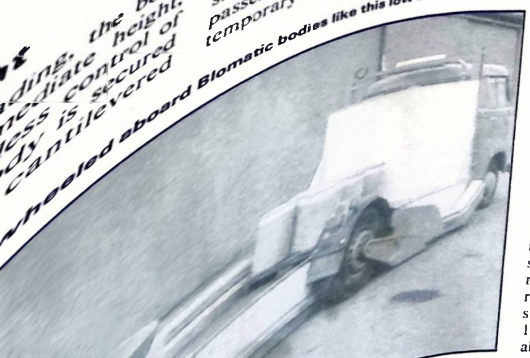
Mercedes L306D is a design inherited from the Hanomag concern when Daimler-Benz took over the Rheinstahl concern some five years ago. The vehicle is well proved, having been in production for 20 years or so. In its latest form it is powered by a 2.2 litre Mercedes OM 615 diesel engine developing 60 bhp. at 4,200 rpm. Maximum torque is 126 Nm., developed at 2,400 rpm.

Drive is taken via a four-speed all-synchromesh gearbox and integral differential. The front (driven) wheels are independently sprung with torsion bars and telescopic shock absorbers. The vacuum-assisted dual-circuit hydraulic brake system is, of course, carried through to the rear wheels of the Blomatic conversion. The handbrake acts on the front wheels only.

Standard equipment on the L306D includes two cab seats, heater, two-speed screenwipers and headlamp wipers. The rear wheels — supported within forks, rather than on the usual stub axles — are standard Mercedes wheels, shod with 6.70-15, 10 ply tyres. Thus one spare serves for all four wheels. □

...ding, the body ...ediate height, ...ess control of ...dy is secured ... cantilevered

...wheeled aboard Blomatic bodies like this low dropside.



...duct ...ost

...nsfer ...porter ...argo airlines

...powered transfer trans... with a 6804 kg capacity ...ken designed and ...ped in the UK by ...matic Ltd. specifically to ...le containers and 244 cm ...ts.

...e 2406D conforms to ...A specifications and meets ...e preference for non-petrol ...ersal vehicles on the apron. ...n be used independently or ...ined with other units from ...company to form a com... cargo handling system.

...Powered by a Perkins 4.236 ...e, the transporter has a 29 ...h maximum speed. Other ...ces can be fitted to ...ification, as can such items ...left-hand drive and crash ...ers.

...Weighing 4072 kg the unit ...s full power hydraulic steer... hydraulic power assisted ...kes and mechanical parking ...ake, and Borg-Warner power ...matic transmission. With a ...wheelbase of 310 cm turning ...dius is 8.25 m.

The power conveyor, which ...omprises five sets of ...neumatic wheels, is ...draulically activated from the ...river's position, and three con...veyor locks are also driver-...perated. Three sections of con...veyor rollers cover the entire ...ength of the transporter and the ...front end height is variable from ...440 mm to 560 mm for transfer ...alignment.

Sweeper/collector with variable discharge height

A tractor-towed hydraulically powered sweeper/collector developed by **Sturdiluxe Ltd.** incorporates a water sprinkler system for dust suppression and a hopper with a variable height discharge facility to enable refuse to be tipped directly into a skip or truck. The sweeper's powerful brush action is designed to pick up heavy items of debris, such as the 13 kg. lump of concrete picked up and deposited in the hopper during pre-lunch trials.

Called the Super Glutton, the sweeper can be towed by any tractor in the 18-30 kW. range and operates off the tractor's P.T.O. (power take-off) system. This method of operation enables the sweeper to be offered at about a quarter of the price of a self-propelled sweeper, the makers say. Unlike ground wheel drive sweepers whose brush rotation is geared to wheel rotation, this sweeper's brushes operate independently of wheel movement. This means that the tractor can slow down or stop altogether when encountering any particularly heavy concentration of debris without the brush can be rotated at speeds of up to 235 rev./min. to remove the debris.

The main sweeping brush has a diameter of 915 mm. (3 ft.) and a sweeping width of 1.7 m. It incorporates eight separate segments which are individually adjusted to compensate for wear, thus ensuring maximum sweeping efficiency and low running costs, since each segment can be replaced separately. Brushes can be supplied in steel wire, polypropylene or in a combination of the two materials. When not in use during transport the brush is raised hydraulically to provide 230 mm. ground clearance. For further information contact **Bewac Ltd.**, Apapa.

Vacuum cleaner with powerful suction

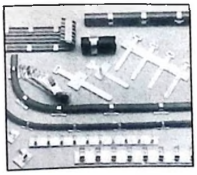
Powerful suction over a broad area is made possible by the wide nozzle of a commercial vacuum cleaner introduced by **Truvox Floorcraft Ltd.**

The UT1 has a specially designed 500 W. motor, and cleaning efficiency is further aided by the 630 mm. wide nozzle and a spiral brush that can be changed quickly and easily. Although of robust construction, with a diecast aluminium body and suction fan to enable it to withstand continuous use in a commercial, environment the UT1 weighs only 7 kg.

Ease of handle reduces operator fatigue and the machine can be easily manoeuvred under low furniture. The turn of a simple adjuster allows it to be used on different types of carpet and hard floors.

Adhesive cable clips easy to use

Adhesive-backed cable clips that are quick and easy to apply have been developed by **C. Brandauer & Co. Ltd.** for fixing various sizes of round or flat-ribbon cable up to a maximum diameter of 75 mm.



Produced from aluminium and backed by an adhesive pad, the clips are said to be less expensive than their usual all-plastic equivalent. In use, the backing paper is simply removed from the clip's polythene backing and the fixture is firmly stuck into the required place. The clip's aluminium arms are then squeezed around the cable to hold it secure. No holes have to be drilled or pins hammered home.

The adhesive is strong and long-lasting and does not damage surfaces to which it is attached. The plastic pad itself offers a high level of insulation.

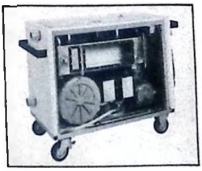
Round cables of up to approximately 10 mm. diameter can be accommodated by the two smallest sizes of clips (ACC 01 and ACC 02). For larger sizes up to 20 mm. in diameter, two self-adhesive versions of the conventional buckle cable fastener are available (ACC 05 and ACC 06). A full range of clips for flat-ribbon cables measuring from 13 mm. to 75 mm. in width is also offered (ACC 10 to ACC 60).

Disinfection of air conditioning systems

Strict hygiene is the first priority in hospitals, pharmaceutical works and microbiological laboratories. This calls, above all, for proper organization and the strict descipline of the medical, technical and laboratory personnel, purpose-oriented constructional layout of the air conditioning system, and correct mode of operation. This applies in particular to systems which have to supply the respective rooms with high-quality filtered air. The following measures have to be taken for this:

Installation of HEPA filters. Disinfection. Microbiological testing of the ducts supplying the air and the rooms.

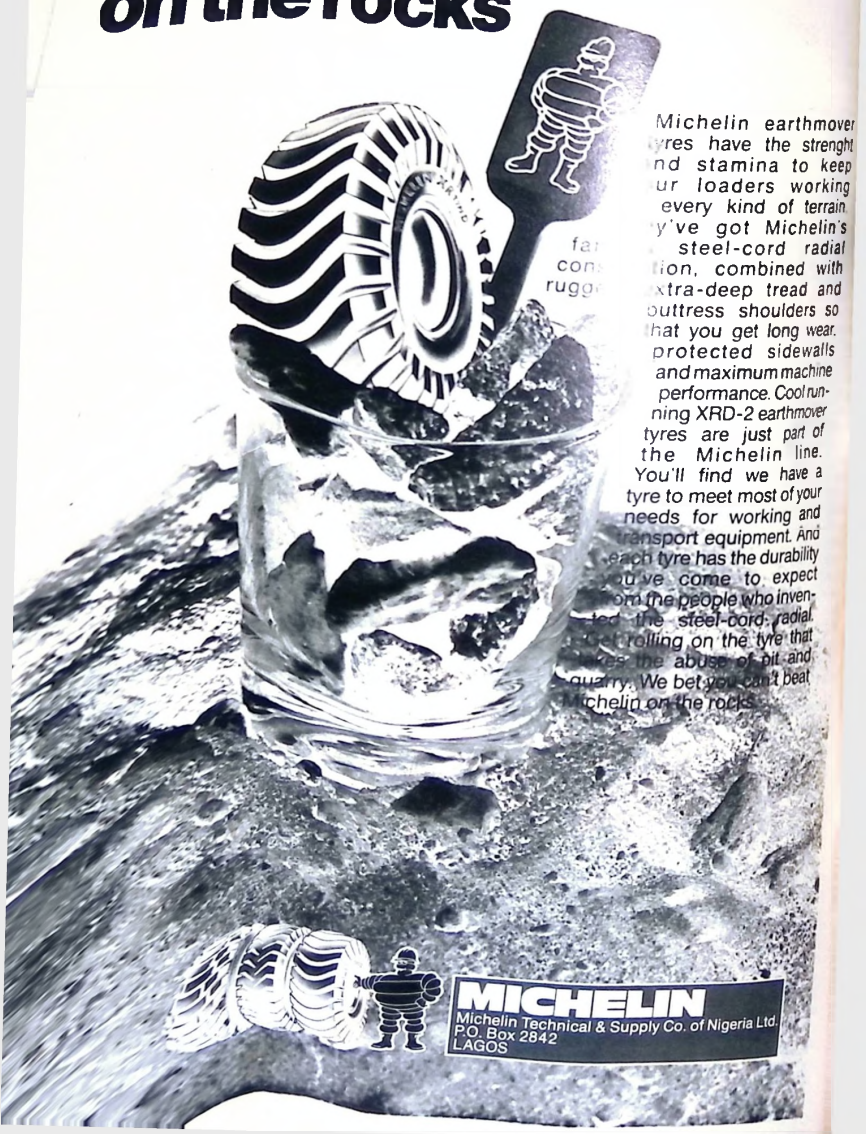
The new Sulzer unit DESAIR for duct and room disinfection may be employed for such applications. It forces an aerosol air disinfectant into the ducting system. Return of the transport air to the unit is effected by way of the connected room and the extract air connection, possibly via a separate disinfection bypass line. The disinfection, which is undertaken over a specific period of time by means of a circulation process, destroys the germs located in the ducts and on the rooms surfaces.



The most suitable times for duct and room disenfection are:

During the commissioning of new or modified air conditioning systems. After the replacement of worn-out HEPA filters. Whenever system operations are interrupted for periods longer than two days. After overhaul work on the clean air system, for example in connection with the air inlets. After sepsis, critical infection or other unforeseen microbiological contaminations in the air conditioned room. For further information contact **Mandilas Ltd.**, Apapa.

Try Michelin on the rocks



Michelin earthmover tyres have the strenght and stamina to keep your loaders working every kind of terrain. They've got Michelin's steel-cord radial action, combined with extra-deep tread and buttress shoulders so that you get long wear, protected sidewalls and maximum machine performance. Cool running XRD-2 earthmover tyres are just part of the Michelin line. You'll find we have a tyre to meet most of your needs for working and transport equipment. And each tyre has the durability you've come to expect from the people who invented the steel-cord radial. Start rolling on the tyre that takes the abuse of pit and quarry. We bet you can't beat Michelin on the rocks.

MICHELIN
Michelin Technical & Supply Co. of Nigeria Ltd.
P.O. Box 2842
LAGOS

...uct
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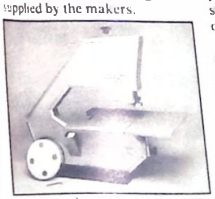
...ing
...ction

...n the photograph is an ...conception of the main ...e of a MIDREX ...g Direct Reduction ...with an annual production ...y of approximately ...00 metric tons per year.

Midrex Corporation ...mmend in a technical paper ...ented at the International ...n and Steel Congress, ...icago, Illinois, that a ...iterranean bottom barge be ...ed to avoid excessive dredg- ...g required by other floating ...ctures. The plant can be ...nstructed on a barge and ...pped to the plant site with ...nual capacities ranging from ...0,000 metric tons per year to ...0,000 metric tons per year ...d over. The plant could be ...lt on a firm budget and ...thin a defined time schedule ...less than 24 months from the ...e of order to production.

Two speed bandsaw

Burgess Power Tools Ltd has introduced a two speed electric bandsaw, the BK2 Powerline, which is said to be equally suitable for general industrial and home use. The machine is claimed to be quiet running and capable of performing both simple and intricate sawing operations. It can also be used for sanding and linishing when fitted with sand/linishing belts supplied by the makers.



Mounted on a base plate with four rubber feet, the saw should require no other mounting or clamping to ensure complete stability in use. Self-ventilating, high torque motors, available for 110 V or 220/240 V single phase a.c. operation, are employed.

The general purpose blade supplied with the machine has speeds of 106 m/min and 396 m/min. It is suitable for metals from 1.5 mm to 25 mm thick and for wood, plastic foam, hardboard, expanded polystyrene and other materials up to 75 mm thick. Other blades for softwoods and chipboard, for example, are available together with sanding/linishing belts in fine, medium and coarse finishes.

Low-grade fuel water tube boilers

A range of water tube boilers manufactured by **Towler & Son Ltd** can operate on virtually any type of combustible material, as well as conventional fuels, for heating or power generating purposes.

Supplied to meet users' individual needs, the Fraser boilers are manufactured in different sizes with evaporation steam capacities ranging from 680 to 2720 Kg/h. Apart from conventional fuels such as coal, gas and oil, the boilers will operate on wood or palm oil wastes; coconut, castor bean or peanut shells; rice and coffee bean husks; bagasse; waste paper and cartons; sewage sludge; town waste and many other vegetable fuels.

To ensure the highest quality and safety standards before dispatch to customers, each boiler is erected on a trial basis at the factory. It is then dismantled and shipped overseas in packaged sections to cut down transport costs. This form of packaging has the additional advantage of facilitating transport from port to site, particularly when long, difficult overland journeys are involved.

Household Digest

Toilet seat designed for comfort

What is claimed to be the most comfortable and hygienic toilet seat has been designed by **Celmac Ltd.** Taking into account the fact that, in a sitting position, 70% of the body's weight is taken on the thighs, the Celeste has been widened in those areas where thigh support

is essential and curved gently at the back to assist correct posture. The robust cover follows the same curve and provides a secure bathroom stool.

In addition to its ergonomic keyhole shape, the seat has ingenious fittings which permit it to be adpated instantly to suit over 150 different sizes of bowl. These fittings provide for simple and rapid installation on any bowl with fixing hole centres 118-210mm apart and between 412mm and 458mm from the front of the seat.

Modric Red-locks

Allgood have introduced a co-ordinated and patented range of locks, using Modric oval cylinders, which has the additional advantage that the cases can be fitted in advance — standard mortice for all locks — and the cylinders fitted later, especially helpful if they are masterkeyed.

The Modric 8299 Cylinder Lock overcomes the problem of meeting both fire and security requirements. In the past, cylinder knobsets have been particularly adaptable for providing a variety of functions to suit special locations where doors have to meet a "means of escape" requirement. However in certain circumstances knobs are not acceptable and a lever handle operation is insisted upon, with consequent difficulty in meeting both fire and security requirements. Allgood also introduce the 8297 Non Dead-locking Nightlatch, 8298 Deadlocking Nightlatch and 8300 Hotel Bedroom Lock.

Automatic floor mopping machine

A lightweight electrically operated automatic mop which is claimed to clean floors faster, more efficiently and more economically than manual mopping methods has been developed by **Ergonare Engineering Ltd.**

Called the Invader Auto Mop, this easy-to-use pedestrian-operated machine weighs only 35kg. It is particularly cost and labour effective when cleaning uncluttered areas (e.g. kitchens and communal appropriate) in such as hospitals, hotels, schools, indoor sports laundries, bars, warehouses, department and public buildings of

New instrument for measuring windows

Ego-Kiefer AG has produced a universal instrument that represents a revolutionary innovation with regard to window measurement. The Vetroscope, as it is called, is a measuring instrument made of plastic (somewhat similar to a slide-rule) capable of rendering invaluable service in the day-to-day work to architects, joiners, window-makers, supervisors, caretakers and managers of building premises. It enables them to determine very rapidly the dimensional characteristics of a window and in particular to measure the thickness of the glass, the depth of the fillister and even the play of the grooves by means of a tongued gauge. All building specialists will appreciate its handiness.

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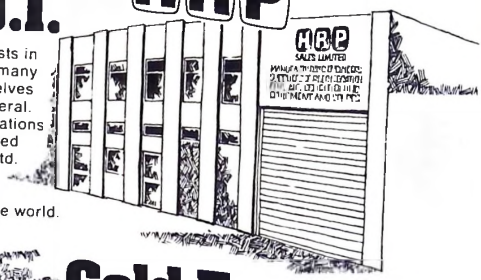
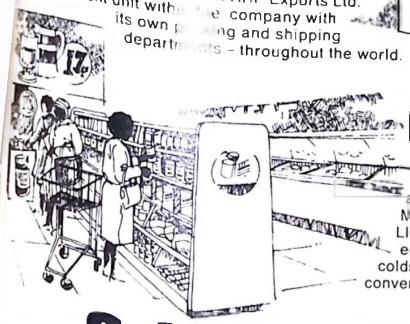
REFRIGERATION

–this is why you should know about HRP

Cold Fact No.1.

HRP Ltd. of London, En[illegible]nd are specialists in every aspect of Refrigerat[illegible] and we make many items of installation equip[illegible]l both for ourselves and for [illegible]ndustry in general. We are now one of the large[illegible]storing organisations in Europe with eight dep[illegible]overing the United Kingdom. We export, th[illegible]a HRP Exports Ltd. an independent unit with[illegible]e company with its own p[illegible]ng and shipping depart[illegible]ts – throughout the world.



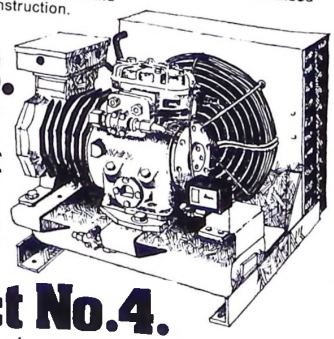


Cold Fact No.2.

We have highly qualified staff to advise on and make recommendations for any applications of commercial and light industrial refrigeration, including COLDSTORES, MORTUARIES, ABATTOIRS, SUPERMARKETS, LIQUID CHILLING etc. As well as supplying all necessary equipment for these, we can also quote for sectionalised coldstores of both modular and conventional construction.

Cold Fact No.3.

We carry a full range of equipment, some examples being Compressors and Condensing Units, 1/12 to 70 H.P. for R.12, R.22 and R.502. ✻ Coolers (wall or ceiling mounting or floor standing) and Remote Condensers ✻ Copper Tube ✻ Fittings ✻ Line Valves ✻ Driers ✻ Liquid Receivers ✻ Controls ✻ Tools ✻ Analysers & Recorders ✻ Refrigerant ✻Hardware ✻ Coldstore doors and frames etc. In addition, any products of our manufacture can be made to your own specification - for many years we have been making liquid receivers and valves for several leading U.K. and Overseas companies.



Cold Fact No.4.

We supply equipment to many famous U.K. food & supermarket companies, to leading breweries and hotel chains, rail and airline operators, oil rigs, shipping lines etc. HRP Exports Ltd. have supplied complete coldstore equipment to Nigeria and similar projects in other African countries. We have supplied equipment for the Government Technical Training School in Nigeria and supply many other overseas governments through the Crown Agents.

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Product Digest

Multi-Cross cut saw

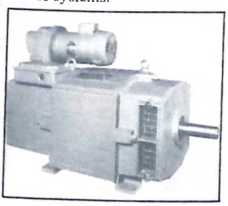
A high production hopper fed cross cut saw that combines operator safety, conveyor outfeed for cut pieces and offcuts, and acoustic enclosures with versatility and speed of size change has been introduced by **W A Fell Ltd.**

The timber stock is loaded into the hopper by the operator and is automatically picked from the hopper by the wheels, clamped and passed through the sawing operation and finally released onto the conveyors that transport both the offcuts/trimmings and the cut pieces.

The hopper is set by two adjustment screws on the front of the machine and these provide both the optimum angle for each job and the correct position for different sizes relative to the feed wheels. The minimum cut length that can be produced is 46mms.

Laminated d.c. motors up to 42 kW

Mawdsley's has introduced a range of Matador laminated d.c. motors with rating from 1.5 — 42 kW. They are designed for operation from both single-phase and three-phase thyristor converters supplies without the need for a smoothing choke and are particularly suitable for use in the company's packaged drives systems.



Outputs are available from four frame sizes, 112, 132, 160 and 180 in self-ventilated or force-ventilated arrangements which will provide [illegible] against constant torque [illegible] 100:1. The 112 [illegible] motor is available with foot or flange mounting, larger frame sizes [illegible] mounting only. Machines fitted with sealed bearings, keywayed bareshaft extension at the drive end.

Motors incorporate Class [illegible] insulation enabling continuous operation in ambients up to [illegible] at altitudes not exceeding [illegible] m above sea level. They have an IEC enclosure classification of IP. 23.

Zed duct system

A new trunking system which dramatically cuts installation costs and assists considerably in power planning and electrical design has been launched by **Metsec Limited.**

As the system can be installed soon after fixing of the roof sheeting on industrial and office buildings it enables electrical installations to be significantly advanced in the building erection programme.

Cost comparisons with other methods of installations in industrial buildings show substantial savings, both on materials and labour, in favour of zed duct. The higher the increase in cost of skilled labour, the higher is the cost saving. It is also a substantially lighter trunking system.

Zed-Duct trunking is made to match the profile of TI Metsec Zed Purlins by utilising the same cold rolling techniques on similar galvanised material, but with optimum reduction in metal thickness. This close fitting and matching combination ensures an extremely robust trunking system which is both mechanically and electrically sound.

A 4.5 metres length of 1" Zed Duct however, weighs less than three kilograms, whereas the same length of conventional lighting trunking can weigh as much as 7.75 kilograms. Such weight savings mean zed can be erected by one man as required.

...erial handling ...est

...veyor ... long ...tainers

... to load and unload 12m. ...ners and large vehicles, a ...e belt conveyor has been ...duced by **Sovex Marshall**

...med the TL5, the con- ...er has an overall length of ...m. When fully retracted, its ...gth is 5.5m. It has an ...nded and retracting speed ...330 mm./sec. The 610 mm. ...e belt, made of three-ply ...on with a pvc/nitrille cover ...es at a standard speed of ...mm./sec. and is reversible.

Telescoping is effected by three powered booms which move simultaneously, handling a maximum load of 40 kg./m. and an end load of up to 200 kg. The standard front boom has a conveyor belt and a short gravity roller section, the rollers being either metal or plastic.

When used solely for vehicle loading the front boom can be made up entirely of gravity rollers, thus providing limited buffer 'storage'. A progressive fall can be incorporated in the boom.

Belt conveyor for arduous duty

A continuous steel slatted belt conveyor designed for specially arduous handling operations, including applications involving high and low temperature conditions, has been introduced by **Gough & Co. (Hanley) Ltd.**

Known as the Econ-O-Belt, the equipment comprises a series of interlocking and overlapping slats to present a smooth, hard, low friction surface, secured to a twin chain circuit mounted on a steel frame assembly. The system includes both drive and tension units and is suitable for in-floor, inclined or vertical installations.

The slats may be constructed of mild steel, galvanised, or stainless steel, suitably

...forced to form a strong, ...id, low weight structure. In ...igning the hinge section the ...nufacturers have paid special ...ttention to preventing the ...gress of debris, any dust and ...mall particles passing through the belt at the discharge positions without harm to the working components. As an alternative to the standard flat load carrying surface, slats may be fitted with cross or interlocking side flights of varying heights. By the use of angled cleats and stepped slats, a vee-shaped belt surface can be provided for duties such as conveying loose materials up steeply inclined paths.

Power sweeper as forklift attachment

A completely self-contained battery powered vacuum sweeper designed as a forklift truck attachment is being offered by **Autocraft Engineers Ltd.** It has a cleaning capacity of 7430 m²/h.

Suitable for use with any standard forklift vehicle, the FL sweeper has its own batteries and can be picked up as easily as a pallet: no connections need be made to the forklift. Its normal manoeuvrability is unimpaired, and performance and life are unaffected.

Product Digest

New pistol grip drills

One of the world's leading power tool manufacturers, **Black and Decker** has introduced a new series of pistol grip portable electric power drills.

Designed and manufactured to meet the requirements of the skilled trademan this new 'GD' range of drills comprises three models: GD94 10mm two speed (780 and 1900rpm), GD96 13mm two speed (750 and 1850rpm) and GD98 13mm two speed (850 and 1900rpm) model with rotary percussion action producing 28,500 'hammer' blows per minute for easy drilling into tough materials such as concrete.

Weighing around 2kg the GD series is compact in size and shape and their power to weight ratios make them ideal for installation engineers, fitters, electricians, plumbers and all skilled trademen and construction builders. For further information contact **Black and Decker (Nigeria) Ltd**, Apapa.

Jig saw with 3-position switch

Since **SKIL** introduced their revolutionary Variable Trigger Speed Switch for electronic speed control of portable power drills 10 years ago, the practical advantages of this invention have been widely recognized. More and more variable speed drills and screwdrivers for do it-yourselfers and tradesmen appeared on the market and at SKIL the demand shows a steady increase in favour of the variable speed control models.

The new model 158H offers more possibilities than a jig saw with just 1 or 2 speeds, as the cutting speed can be adapted to any job and any material: synthetic materials, such as plexiglass, eternite, formica, PVC — with the advantage that melting of the material can be prevented by adapting the cutting speed; ferrous and non-ferrous metals of different alloy and hardness; soft to very hard timbers; composition materials, such as fibreboard, chipboard, plywood, abrasive [illegible] In short, practically all materials can be [illegible] with the new saw. It is only [illegible] tion of selecting the prop[illegible] blade and the right spe[illegible] more information contac[illegible] & Co (Nigeria) Ltd [illegible] and Priorities Ltd. A.F.G.O., Dakar.

Hydraulic-[illegible] coupling

A new range of [illegible] join and intrinsically safe [illegible] hose couplings for [illegible] fluid power industry has been introduced by **Europower Hydraulics Limited**. Named Eurolok, the new fittings are available in various sizes and are intended primarily for the mining industry, [illegible] are expected to be [illegible] in other industries where [illegible] a need for rapid assembly [illegible] replacement.

At present, production [illegible] lost when equipment [illegible] transferred from one [illegible] to another and conventional [illegible] hydraulic connections [illegible] be made or unmade. Eurolok [illegible] fittings reduce this [illegible] time substantially. Again [illegible] threaded connections in [illegible] hydraulic systems frequently [illegible] corrode, impeding disconnection for maintenance or [illegible] transfer: Eurolok couplings [illegible] which are quick and easy to [illegible] separate, overcome this [illegible] problem.

The couplings consist of [illegible] female sockets and male nipples [illegible] in various configurations, held [illegible] together by 'U' pins which are [illegible] readily withdrawn when [illegible] required. Sealing is by nitrile [illegible] rubber 'O' rings, backed up by [illegible] PTFE anti-extrusion washers.

Product Digest

Helping children to count

Weighted plastics numerals to help children to recognise numbers and do sums have been introduced by **E. S. Perry Ltd.**

Each of the Osmiroid Wayno weighted numbers is 65 mm. high and carries as many raised dots on its face as the numerical value it represents. The weight in grammes of each shape also corresponds to its numerical value so that weighing and counting can be done simultaneously. One-gramme cubes for use with the weighted numbers can be supplied to enable children to gain further experience.

The numerals are offered in packs of eleven (1 to 10 plus an additional 5). Each number lies flat and is made of a non-toxic light blue plastics material.

Measuring air velocity

Capable of measuring air velocities from 0.1 m./sec. to 30 m./sec., a hand-held battery operated electronic anemometer utilises a thermally compensated probe, which reduces the effect of air temperature on readings over a wide temperature range has been introduced by **Airflow Developments Ltd.**

To allow the user to reach wall or ceiling mounted terminals, the TA 6000 can be fitted with interlocking extension rods, supplied with the instrument.

The probe is placed at right angles to the air-flow to be measured and the start button pressed. The air velocity can then be read on the semi logarithmic 75 mm. scale, which enables high reading accuracy to be maintained throughout the range.

The instrument, which may be used to check ventilation conditions in potentionally hazardous areas such as paint spray shops, metal treatment baths, and asbestos handling areas, measures 170 mm. x 95 mm. x 40 mm., and power is derived from four 9 V. batteries. The probe is 170 mm. long x 15 mm. diameter.

The instrument is supplied with a lightweight carrying case fitted with shoulder straps and belt loops. A battery check facility is also provided.

Automatic instruments for precise plumbing

There is a growing trend in the construction industry to higher levels of accuracy both in the construction work itself and for the inspection of the finished building. The importance of constant supervision grows with the height of the building. Skyscrapers, communications towers, dams and mine shafts are only some of the types of construction which are subject to deformation by external factors. Ground depressions too, can endanger a building. That is why safety authorities are showing an ever keener interest in precise plumbing instruments.

With such tasks in mind, **Wild Heerbrugg** has developed an extremely precise automatic plumbing system — the ZL Zenith Plummet and the NL Nadir Plummet — a system truly deserving the attribute automatic. Two pendulum compensators acting at right angles to each other automatically define two vertical planes, the intersection of which is the plumb line. Plumbing accuracy is 1 mm. at 200 metres.

Medical digest

Portable ECG monitor

High trace resolution, an integral ratemeter, a memory facility and the ability to freeze (hold) any particular screen display are among the main features of a portable mains/battery electrocardiogram (ECG) monitor introduced by [illegible]bridge Medical Instrumen[illegible]

Called the C[illegible], the monitor is housed [illegible]genic white plastics c[illegible]d is designed on uncl[illegible] lines with push-button [illegible] for easy use by [illegible] staff. Although primarily [illegible]d for bedside use, the [illegible] is equally at home [illegible]ating theatres, coronary [illegible]nits and emergency [illegible]ation stations. A drawer [illegible]ach fits under the [illegible] is available for storing the mains lead, patient lead and electrodes.

The 80 mm. x 10[illegible] screen provides a sharp [illegible] and stable trace with a [illegible] resolution of 10 bits [illegible] means that the digital d[illegible] (built up from a large n[illegible] consecutive dots) is accura[illegible] one part per thousand – a [illegible] degree of accuracy, comp[illegible] with other monitors of this [illegible] which generally provide [illegible] vertical resolution. Anot[illegible] advantage of the higher reso[illegible]tion over the lower is [illegible] "staircasing" is reduced to [illegible] minimum. For further inform[illegible]tion contact **Ferrol[illegible] International Traders (Nigeria) Ltd., Ikeja.**

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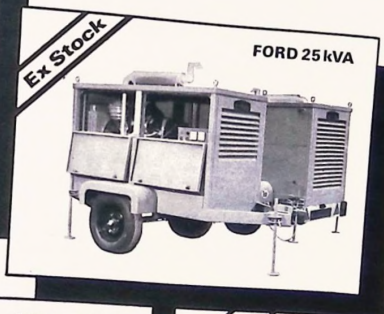

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M155

buyers' guide

A guide to services and supplies for buyers in West Africa

Organisations involved in supplying or servicing industry, government or commerce may be listed in this guide for a period of 12 months at: Naira 75.00, Cedes 135.00, Leone 100.00, $125.00, or equivalent per listing. For entry form see Page 220.

CLASSIFIED INDEX

Full addresses listed alphabetically on following pages.

Abrasives
Bisiolu Enterprises Ltd., Apapa.
Landmark Industrial Supplies Limited.

A. C. Motor Starting Capacitors
Daly (Condensers) Ltd., Dorset, UK.

Accounting Machines & Systems
GBO BEAM (a Division of UAC of Nigeria Ltd.), Lagos.
Leventis Technical Ltd., Lagos.

Adhesives
Bostik Ltd., Leicester, UK.

Agricultural and Electrical Appliances
W. A. Dizengoff (Nigeria) Ltd., Apapa.
Makin Ltd., Ilupeju.

Agricultural Equipment
Afrotec Technical Services (Nigeria) Ltd., Isolo.
J. Allen & Co. Ltd., Apapa.
Blackwood Hodge (Nigeria) Ltd., Apapa.
R. T. Briscoe (Nigeria) Ltd., Agricultural Equipment Dept., Iganmu.
W. A. Dizengoff (Nigeria) Ltd., Apapa.
Hallam Graders, Leicester, UK.
Leventis Motors Ltd., Apapa.
Makin Ltd., Ilupeju.
Morpol Industrial Corp. Ltd., Apapa.
NITECO, Apapa.
Phoenix Motors Ltd., EB, Lagos.
Bewac Limited, Apapa.
Leventis Motors Ltd., Lagos.
Nigerian Motors, Apapa.
UTC Technical, Isolo-Mushin.
Waateco Ltd., Technical Division, Lagos.

Air Cargo Services
IML Airchartering (Nigeria) Ltd., Lagos and Kano.

Air Courier Services
IML Airchartering (Nigeria) Ltd., Lagos and Kano.

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Blackwood Hodge (Nigeria) Ltd., Apapa.
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Guthrie (Nigeria) Ltd., Lagos.
Joy Manufacturing Co., USA.
Rutam Limited, Lagos.
R. T. Briscoe (Nigeria) Ltd., Apapa.
Holman Brothers (Nigeria), Apapa.
Phoenix Motors Ltd., Lagos.
Waateco Ltd., Technical Division, Lagos.
Wayne (West Africa) Ltd., Apapa.

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Adeoye Adejobi T. S. Ltd., Ibadan.
Drake & Scull (Nig.) Ltd., Lagos.
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Nigerian Motors Industries Ltd., Apapa.
Tarpaulin Industries (WA) Ltd., Apapa.

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Automotive Parts
J. Allen & Co. Ltd., Apapa.
Leventis Motors Ltd., Apapa.
NITECO, Apapa.

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Makeri Smelting Co. Ltd., Jos.

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Makin Ltd., Ilupeju.

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Blackwood Hodge (Nigeria) Ltd., Apapa.
M. & E. (a Division of UAC of Nigeria) Ltd.
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NITECO, Apapa.

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Afrotec Technical Services (Nigeria) Ltd., Isolo.
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VYB (Nigeria) Ltd., Apapa.

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Makin Ltd., Ilupeju.

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Costain (West Africa) Ltd., Lagos.
Cubitts Nigeria Limited, Lagos.
George Wimpey & Co. (Nigeria) Ltd., Lagos.
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Structor, Apapa.
Taylor Woodrow of Nigeria Limited, Lagos.

Building Materials
Bewac Limited, Apapa.
Bisiolu Enterprises Ltd., Apapa.
Chellcram's Building Materials Department, Apapa.
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Dunlop Nigerian Industries Ltd., Ikeja.
Fibreglass Reinforced Plastics Co. Ltd., Abeokuta.
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Nigerian Commercial & Industrial Enterprises Limited, Lagos.
Nigerian Foundries Limited.
Henry Stephens Builders' Merchants, Apapa.
C. Zard & Co. Ltd., Lagos.
Minister Technical Services (Nigeria) Ltd., Kano.

Business Services Recruitment Business Travel Agents
Air Marketing International Group of Co's, Crawley, UK.
All Counties Business Agency, UK.

Capacitors — AC Motor Starting & Electrolytic
Daley (Condensers) Ltd., Dorset, UK.

Catering Equipment
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Nirexim GmbH, Vienna.
F. Steiner & Co. Ltd., Lagos.
VYB (Nigeria) Ltd., Apapa.
C. Zard & Co. Ltd., Lagos.

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Chemical Engineering
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Morpol Industrial Corp. Ltd., Apapa.
Nigerian Motors Industries Ltd., Apapa.
NITECO, Apapa.
Henry Stephens Engineering Co. Ltd., Ilupeju Industrial Estate.
Scvatrac, Ikeja.
UTC Technical, Isolo-Mushin.

Computers & Related Services
GBO BEAM (a Division of UAC of Nigeria Ltd.), Lagos.
Haven Nigerian Computer Co. Ltd., Lagos.
Leventis Technical Ltd., Lagos.

Concrete Machinery
Afrotec Technical Services (Nigeria) Ltd., Isolo.
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Morpol Industrial Corp. Ltd., Apapa.
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UTC Technical, Isolo-Mushin.

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Henry Stephens Engineering Co. Ltd., Ilupeju Industrial Estate.
Holt Engineering (a Division of J. Allen & Co. Ltd.), Apapa.
Leventis Motors Ltd., Apapa.
Nigerian Motors Industries Ltd., Apapa.
Stronghold (Nigeria) Ltd., Engineering Services Division, Ikeja.
Waateco Ltd., Technical Division, Lagos.

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Dewatering Wellpoint Equipment & Services
Morpol Industrial Corp. Ltd., Apapa.

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Afrotec Technical Services (Nigeria) Ltd., Isolo.
Blackwood Hodge (Nigeria) Ltd., Diesel Sales and Service Division, Apapa.
R. T. Briscoe (Nigeria) Ltd., Technical Department, Matori — Oshodi.

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Leventis Technical Ltd., Lagos.
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Minister Technical Services (Nigeria) Ltd., Kano.
Nigerian Motors Industries Ltd., Apapa.
NITECO, Apapa.
Phoenix Motors Ltd., EB, Lagos.
Powermaker Generators (Technical Division Tarpaulin Inc. (WA) Ltd.), Apapa.
Scoatrac, Ikeja.
Stockvis Nigeria Limited.
Stronghold (Nigeria) Ltd., Engineering Services Division, Ikeja.
Structor Technique, VYB (Nigeria) Ltd., Apapa.
UTC Technical, Isolo Mushin.
Waateco Ltd., Technical Division, Lagos.
C. Zard & Co. Ltd., Lagos.

Diesels — Industrial and Marine

Blackwood Hodge (Nigeria) Ltd., Apapa.
R. T. Briscoe (Nigeria) Ltd., Technical Department, Apapa.
Holt Engineering Ltd., Apapa.
Leventis Technical Ltd., Lagos.
M. & E. (a Division of UAC of Nigeria) Ltd.
Nigerian Motors Industries Ltd., Apapa.
Henry Stephens Engineering Co. Ltd., Ilupeju Industrial Estate.
Stokvis Nigeria Limited.
Tarpaulin Industries (WA) Ltd., Apapa.
UTC Technical Division, Isolo Mushin.

Dispensing and Bulk Pumps

Wayne (West Africa) Ltd., Apapa.

Doors & Windows

Aluminium Manufacturing Company of Nigeria Limited (Alumaco), Apapa.
Bisiolu Enterprises Ltd., Apapa.
Crittall-Hope Nigeria Limited.

Dredging & Reclamation Contractors

Nigerian Dredging & General Works Ltd., Apapa.
Westminster Dredging (Nig.) Ltd., Lagos.

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Afrotec Technical Services (Nigeria) Ltd., Isolo.
Conveyancer (Nig.) Ltd., Apapa.
Leventis Motors Ltd., Apapa.
M. & E. (a Division of UAC of Nigeria) Ltd., Lagos.
Morpol Industrial Corp. Ltd., Apapa.
Nigerian Motors Industries Ltd., Lagos, Scoatrac, Ikeja.
Structor Technique.
UTC Technical, Isolo Mushin.

Earthmoving Equipment

Afrotec Technical Services (Nigeria) Ltd., Isolo.
Bewac Ltd., Apapa.
Blackwood Hodge (Nigeria Ltd., Apapa.
Greenham Plant Hire (a Division of UAC of Nigeria Ltd.), Ikeja.
Holt Engineering Ltd., Apapa.
Conveyancer (Nigeria) Ltd., Apapa.
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Holman Brothers (Nigeria) Ltd., Apapa.
Joy Manufacturing Co., USA.
Leventis Motors Ltd., Lagos.
Nigerian Motors Industries Co. Ltd., Apapa.
Scoatrac, Isolo.
Stronghold (Nigeria) Ltd., Engineering Services Division, Ikeja.
Tractor & Equipment (a Division of UAC of Nigeria Ltd.), Lagos.

Electrical Contracting Materials

Cutler Hammer Nigeria Ltd., Yaba.
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Pan Electric, Apapa.

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EMS (a Division of UAC of Nigeria Ltd.), Apapa.
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Haven Nigerian Computer Co., Lagos.
Holt Engineering Ltd., Apapa.
Leventis Technical Ltd., Lagos.
Mofat Engineering Co. Ltd., Lagos.
Nigerian Computer Co., Lagos.
NITECO, Apapa.
G. N. Okosala Electric Company.
VYB (Nigeria) Ltd., Apapa.

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Electric Cable & Overhead Conductor.
Bennet Baby Electrical Co., Ikeja.
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A. D. Green & Co. Ltd., Ibadan.
Heplac Nigeria Ltd., Lagos.
Marryat Daniel (Nigeria) Ltd., Lagos.
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Mofat Engineering Co. Ltd., Lagos.
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Electrical Projects

Afrotec Technical Services (Nigeria) Ltd., Isolo.

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Cutler Hammer Nigeria Ltd., Ikeja.
Drake & Scull (Nigeria) Ltd., Lagos.

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Fibreglass Stockists

Pilkington Glass (Nigeria) Ltd., Apapa.

Fire Fighting Equipment & Vehicles

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Leventis Motors Ltd., Lagos.
SIDES.
Stronghold (Nigeria Ltd., Security & Safety Services Division, Ikeja.

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Wayne (West Africa) Ltd., Apapa.

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Makin Ltd., Ilupeju.
UTC Technical, Isolo-Mushin.

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Bewac Limited, Apapa.
R. T. Briscoe (Nigeria) Ltd., Technical Department, Apapa.
Conveyancer (Nig.) Ltd., Apapa.
Leventis Motors Ltd., Lagos.
Nigerian Motors Industries Ltd., Apapa.
NITECO, Apapa.
Tractor & Equipment (a Division of UAC of Nigeria Ltd.), Lagos.
Engineering Services Division, Ikeja.
Henry Stephens Engineering Co. Ltd., Apapa.
Tarpaulin Industries (WA) Ltd., Apapa.
Waateco Ltd., Ikeja.

French Windows and Doors

Crittall-Hope Nigeria Ltd.
Steel Works Ltd., Ibadan.

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Garage Equipment

Stokvis Nigeria Limited.
VYB (Nigeria) Ltd., Apapa.
Wayne (West Africa) Ltd., Apapa.
C. Zard & Co. Ltd., Lagos.

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Makin Ltd., Ilupeju.

Glass/Mirrors Processors

Pilkington Glass (Nigeria) Ltd., Apapa.

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Blackwood Hodge (Nigeria) Ltd., Apapa.
Holt Engineering Ltd., Apapa.
Morpol Industrial Corp. Ltd., Apapa.
Nigerian Motors Industries Ltd., Apapa.

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Landmark Industrial Supplies Limited.

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Nirexim GmbH, Vienna.
Equipment Ltd., London.
F. Steiner & Co. Ltd., Lagos.
UTC Technical, Isolo-Mushin.

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Gas & Welding (Nigeria) Ltd., Ikeja.

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Interbroker & Co.

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Afrotech Technical Services (Nigeria) Ltd., Isolo.
Guthrie (Nigeria) Ltd., Lagos.
Leventis Technical Ltd., Lagos.
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Stockvis Nigeria Limited.

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Nirexim GmbH, Vienna

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Nigeria Engineering Works Ltd., Port Harcourt.

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Reiss & Co. (Nigeria) Ltd., Lagos

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Makin Ltd., Ilupeju.
UTC Technical, Isolo-Mushin

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Holt Engineering Ltd., Apapa
Leventis Technical Ltd., Lagos
M. & E. (a Division of UAC of Nigeria Ltd.), Lagos.
Nigerian Motors Industries Ltd., Apapa.
Stokvis Nigeria Limited, Ebute Metta.
Stokvis Nigerian Tool & Die Co. Ltd., Ebute Metta.
UTC Technical, Isolo Mushin.
C. Zard & Co. Ltd., Lagos.

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Bisiolu Enterprises Ltd., Apapa.

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Blackwood Hodge (Nigeria) Ltd., Diesel Sales and Service Division, Apapa.
R. T. Briscoe (Nigeria) Ltd., Lagos.
Holman Brothers (Nigeria) Ltd., Apapa.
Nigerian Motors Industries Ltd., Apapa.
Henry Stephens Engineering Co. Ltd., Apapa.
UTC Technical, Isolo Mushin.

Mechanical and Electrical Engineering Contractors

Adeoye Adejobi Trading Stores Ltd., Ibadan.
Fado Engineering Co. Ltd., Ebute Metta.
Haden Nigeria Ltd., Ilupeju
Heplac Nigeria Ltd., Lagos

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J. Allen & Co. Ltd., Apapa.
R. T. Briscoe (Nigeria) Ltd., Motor Division, Iganmu.
Henry Stephens Engineering Co. Ltd., Apapa.
Leventis Motors Ltd., Apapa
NITECO, Apapa.
Phoenix Motors Ltd., EB, Lagos.
Waateco Ltd., Iganmu.

Office Equipment

GBO BEAM (a Division of UAC of Nigeria Ltd.), Lagos.
Leventis Technical Ltd., Lagos.
Nigeria Engineering Works Ltd., Port Harcourt.
F. Steiner & Co. Ltd., Lagos.

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Steel Works Ltd., Ibadan.

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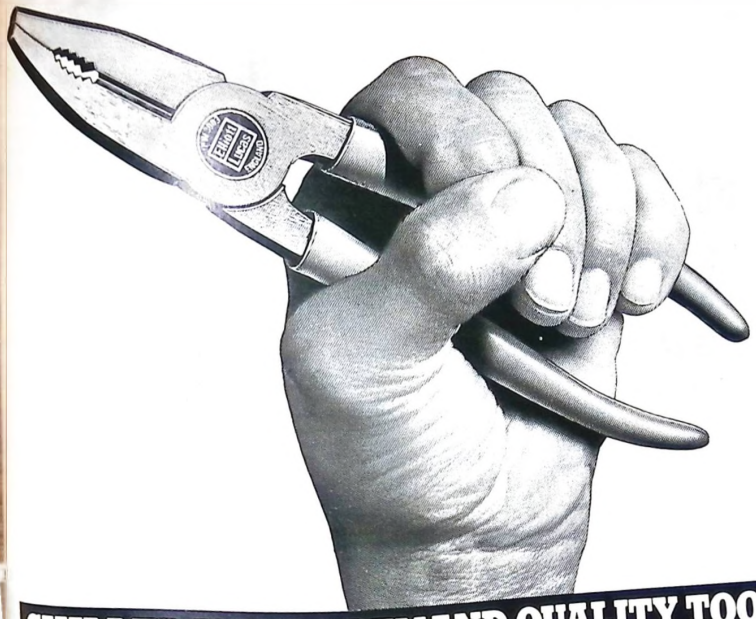

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Makin Ltd., Ilupeju.
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Wayne (West Africa) Ltd., Apapa.

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Bisiolu Enterprises Ltd., Apapa.
Brosette (Nigeria) Ltd., Apapa.
Dunlop Nigerian Industries Ltd., Ikeja.
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Interplast Ltd., Accra.
Leventis Stores, Lagos.

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Greenham Plant Hire (a Division of UAC of Nigeria Ltd.), Ikeja.

Plastic Processing Equipment
Makin Ltd., Ilupeju.

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Makin Ltd., Ilupeju.
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Makeri Smelting Co. Ltd., Jos.

Projected Windows
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Afrotec Technical Services (Nigeria) Ltd., Isolo.
R. T. Briscoe (Nigeria) Ltd., Technical Department, Apapa.
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Henry Stephens Engineering Co. Ltd., Apapa.
Holman Brothers (Nigeria) Ltd., Apapa.
Leventis Technical Ltd., Lagos.
M. & E. (a Division of UAC of Nigeria Ltd.), Lagos.
NITECO, Apapa.
Phoenix Motors Ltd., Lagos.
Stokvis Nigeria Limited, Ebute-Metta.
UTC Technical Division, Apapa.
VYB (Nigeria) Ltd., Apapa.
Waateco Ltd., Technical Division, Lagos.

Quarry Plant
Afrotec Technical Services (Nigeria) Ltd., Oshodi.
Blackwood Hodge (Nigeria) Ltd., Apapa.
M. & E. (a Division of UAC of Nigeria Ltd.), Lagos.

Radio Communication Equipment
R. T. Briscoe (Nigeria) Ltd., Telecommunications Dept., Apapa.
J. Allen & Company Ltd., Apapa.
Communications Associates of Nigeria Ltd., Ikeja.
Mofat Engineering Co. Ltd., Lagos.
Philips (Nigeria) Ltd., Lagos.
Plessey (Nigeria) Ltd., Lagos.

Radio Distributors
Leventis Technical Ltd., Lagos.
Pan Electric (a Division of UAC of Nigeria Ltd.), Ebute-Metta.

Road Making Equipment
Blackwood Hodge (Nigeria) Ltd., Apapa.
Joy Manufacturing Co., USA.
Leventis Motors Ltd., Apapa.
M. & E. (a Division of UAC of Nigeria Ltd.), Lagos.
Morpol Industrial Corp. Ltd., Apapa.
NITECO, Apapa.
Phoenix Motors Ltd., EB, Lagos.
Henry Stephens Engineering Co. Ltd., Apapa.

Roller Shutter Doors
Crittall Hope Nigeria Limited, Ikeja.
Steel Works Ltd., Ibadan.

Roofing & Cladding Materials
Alumaco Aluminium Manufacturing Co. of Nigeria Ltd., Apapa.
Fibreglass Reinforced Plastics Co. Ltd., Abeokuta.

Ropes
Nigerian Ropes Ltd., Apapa.

Sanitary Ware & Fittings
Bisiolu Enterprises Ltd., Apapa.
Nigerian Foundries Ltd., Lagos.
Leventis Stores, Lagos.
Structor, Apapa.
F. Steiner & Co. Ltd., Lagos.
Henry Stephens Engineering Co. Ltd., Apapa.
C. Zard & Co. Ltd.
Projects Department, Apapa.
Henry Stephens Engineering Co. Ltd., Apapa.

Science & Laboratory Instruments
A. M. Faltas (West Africa) Ltd., Lagos.
F. Steiner & Co. Ltd., Lagos.

Sealants
Bostik Ltd., Leicester, UK.

Sewage Treatment Plant
Bewac Ltd., Apapa.
R. T. Briscoe (Nigeria) Ltd.

Shelving Systems
The Twilights Nigeria Ltd.

Shipping and Forwarding Agents
Air Marketing International Group of Co's, Crawley, UK.

Soil Investigation
Nigerian Dredging & General Works Ltd., Lagos.

Solders
Makeri Smelting Co. Ltd., Jos.

Steel Structures
Nigerian Engineering Works Ltd., Port Harcourt.
Steel Works Ltd., Ibadan.

Storage & Equipment
Dexion Dept.
Gottschalcks Building Materials, Apapa.
Leventis Stores Ltd., Lagos.
Nigeria Engineering Works Ltd., Port Harcourt.
Stronghold (Nigeria) Ltd., Handy Angle Division, Ikeja.

Survey Equipment
Plessey (Nigeria) Ltd., Lagos.
F. Steiner & Co. Ltd., Lagos.

Telephone Equipment
J. Allen & Company Ltd., Apapa.
Philips (Nigeria) Ltd., Lagos.
Plessey (Nigeria) Ltd., Lagos.
Sentrycom Alarms (Nigeria) Ltd., Lagos.
Ultra Modern Electronics Ltd., Surulere.

Time Card Clocks & Systems
Leventis Technical Ltd., Lagos.
F. Steiner & Co. Ltd., Lagos.
Bisiolu Enterprises Ltd., Apapa.

Under Water Services
Nigerian Diving Services, Lagos.

Water and Irrigation Equipment
Afrotec Technical Services (Nigeria) Ltd., Isolo.
Jos. Hansen & Soehne Nigeria Ltd.

Welding Equipment
Bisiolu Enterprises Ltd., Apapa.
R. T. Briscoe (Nigeria) Ltd., Technical Department, Matori.
Holt Engineering Ltd.
Industrial Gases Ltd.
Landmark Industrial Supplies Limited.
Stokvis Nigeria Limited, Ebute-Metta.
UTC Technical, Isolo.
VYB (Nigeria) Ltd., Apapa.
C. Zard & Co. Ltd., Lagos.
Waateco Ltd., Technical Division, Lagos.

Wire Products
Nigerian Wire Industries Limited.

Woodworking Machinery
UTC Technical, Isolo.
C. Zard & Co. Ltd., Lagos.

Zed Purling & Castellated Beams
Steel Works Ltd., Ibadan.

ALPHABETICAL LISTINGS

Adeoye Adejobi Trading Stores Ltd.,
P.O. Box 763, Ibadan. Tel. 24037.
Afrotec Technical Services (Nigeria) Ltd.,
PMB 1061, Oshodi, Lagos.
Tel. 45656/44706.
Alakija & Alakija Contracting Services Ltd.,
6 Ondo Street, West Ebute Metta, Lagos, Nigeria. Tel. 48286.
Air Marketing International Group of Co's,
9 Church Road, Lowfield Heath, Crawley, Sussex, UK. Tel. Crawley 515651. Telex 877180.
Alhaji M. R. Shittu & Sons Ltd.,
41 Oguntola Street, Shomolu, Lagos. Tel. 44191.
All Counties Business Agency,
West House, Slough Lane, Saunderton, Nr. High Wycombe, Bucks., UK. Tel. 024024 3701. Telex 837560.
J. Allen & Company Ltd.,
P.O. Box 542, 25 Creek Road, Apapa. Tel. 47881.
Allens Marine, J. Allen & Co. Ltd.,
9/10 Yakubu Gowon Drive, P.O. Box 282, Port Harcourt, Rivers State, Nigeria.
Alumaco Aluminium Manufacturing Company of Nigeria Limited,
25 Burma Road, P.O. Box 60, Apapa. Tel. 44664/5, 44686.
Aluminium Manufacturing Company of Nigeria Limited (Alumaco),
32 Creek Road, P.O. Box 60, Apapa. Tel. 44664/5, 44686.
Aluminium Wire and Cable Co. Ltd.,
Port Tennant, Swansea, Glamorgan, Great Britain.
Bennett Baba Electrical Co.
P.O. Box 444, Ikeja, Lagos.
Berger Paints Nigeria Ltd.
Oba Akran Ave., PMB 1052,
Bewac Limited,
1 Commercial Road, PMB
Apapa. Tel. 45055, 41193
Bisiolu Enterprises Ltd.
1 Warehouse Road, Apapa
3214, Lagos. Tel. 47268.
Telex BEKBEK 21543N
Blackwood Hodge (Nigeria) Ltd.
15 Burma Road, P.O. Box 18
Tel. 47107/47049.
Bostik Ltd.,
Ulverscroft Road, Leicester LE
Tel. Leicester 50015. Telex 342
R. T. Briscoe (Nigeria) Ltd.
Agricultural Equipt. Dept., Iganmu
Technical Dept., Matori & Odofin
Apapa.
Motor Division: Iganmu.
Telecommunications Dept., Apapa
Projects Dept., Apapa. Tel 46
Brossette (Nigeria) Ltd.
311 Apapa Road, PMB 1135, Apapa
Calabar Cement Co. Ltd.
P.O. Box 219, Calabar. Tel. 30
Caleb Brette & Son (Nig.) Ltd.
29/34 NPA Commercial Block "A"
Wharf Road, P.O. Box 52, Apapa
45456, 47015.
Chellaram's Building Materials Department,
19 Wharf Road, Apapa. Tel. 461
Controls and Automation,
270 Herbert Macaulay Street, P.O. Box
448, Apapa. Tel. 41958.
Conveyancer (Nigeria) Ltd.
Plot 12, Iganmu Industrial Estate
Iganmu, PMB 1189, Apapa. Tel.
47025.
Communications Associates of Nigeria Limited,
Industrial Crescent, Ilupeju Industrial
Estate, PMB 1129, Ikeja. Tel. 32206,
32207 & 32208.
Costain (West Africa) Ltd.
174 Western Avenue, P.O. Box 85,
Lagos. Tel. 43474/5/6.
Crittall Hope Nigeria Limited,
Acere Motor Road, P.O. Box 28, Ikeja
Lagos. Tel. 41408.
P.O. Box 231, Kaduna. Tel. 4232
P.O. Box 1336, Ibadan. Tel. 6147
P.O. Box 398, Port Harcourt. Tel.
21165.
Cutler Hammer Nigeria Ltd.
5 Eleruwa Street, Ikeja Industrial
Estate, P.O. Box 490, Ikeja.
Daly (Condensers) Ltd.
Granley Works, Granby Ind. Estate
Weymouth, Dorset DT4 9TE, UK
Tel. 0305 7 2871. Telex 41476
Dexion Dept., Gottschalcks Building Materials,
P.O. Box 321, Burma Rd., Apapa
Tel. 47298/9.
W. A. Dizengoff (Nigeria) Ltd.
23 Creek Road, P.O. Box 340, Apapa
Tel. 42080, 42089.
Drake & Scull (Nigeria) Ltd.
P.O. Box 2389, 90 Lewis St., Lagos
Tel. 27289. Telex 21298
Dulux, ICI Paints (Nigeria) Ltd.
Adeniyi Jones Avenue, Industrial
Estate, Ikeja.
Dunlop Nigerian Industries Ltd.
Oba Akran Avenue, PMB 1079, Ikeja
Tel. 3165.
EMS,
40 Warehouse Road, Apapa.
Etco (Nigeria) Ltd., Engineering & Technical Co.,
14 Creek Road, P.O. Box 337, Apapa
Tel. 46666 & 42127.
Equip/Iard (a Division of SCOA (Nigeria) Limited),
52 Kosoko Street, Alakoro, P.O. Box
7419, Lagos. Tel. 50738.
Fado Engineering Co. Ltd.,
Phoenix Motors Building, 52/54
Murtala Mohammed Way, P.O. Box 35,
Ebute Metta. Tel. 44006.

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he Datsun F02 roves Big Things Take Place hen Nissan Sets Out o Engineer Breakthroughs

nly 1 outstanding feature. That's the rouble with most forklift designs. But tal performance determines the true alue of materials handling equipment. o, Nissan decided the time was ripe engineer some changes.
he new-generation Datsun Forklift 02 incorporates a number of super nprovements. Attractive, low-profile yling creates double benefits—higher ad stability and a lower floor level. 02 models safely lift their rated andard load to a height of at least 4 meters. Warm white and orange colors bring out the new personality. A smaller minimum turning radius (2,150mm for 2-ton; 2,220mm for 2.5-ton) results from reduced external dimensions. Lifting speed is a stable 490mm/sec* Which is considered ideal for most jobs.
Operator comfort and safety reach new levels. Single-lever tilt/lift, power steering, improved forward visibility and a well-padded bucket seat keep operator fatigue down. The non-slip floor mat, rigid overhead guard with rain drip channel and duo-servo, self-adjusting brakes instill greater confidence. Plus other recommendable optional safety equipment is available.
Simplified servicing further enhances traditional Datsun reliability. The maximum use of standardized, heavy-duty components provides superior, long-life operating economy.
The Datsun Forklift F02 Series. It's totally engineered by Nissan for profitable performance.

*Standard gasoline engine models.

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