Importance of Time Lags for Economic Planning

W B Reddaway

The paramount necessity of taking a long view of the development process has to be emphasised if planning is to be really successful.

This means that one must not look only at results to be achieved within the five years covered by the Third Plan: on that basis, one could achieve the maximum increase in output by concentrating almost all investment expenditure on schemes which could be completed within the five year period, leaving nothing in the way of half-finished schemes as a "legacy" for the Fourth Plan period.

It is unlikely that any planners would make the mistake of over-looking the future to such an extent as to concentrate exclusively on schemes maturing within the five year period. Nevertheless, it is all too easy to fail to include in a plan sufficient work on the very early stages of projects which will take a long time to complete.

By neglecting these—which yield no immediate results—the First Plan period showed an apparently creditable record of achievement in relation to outlay: but it left a very poor legacy for the second, which had to bear all the burdens of constructing the three steel plants whilst reaping no benefits at all until the last year or so.

It was inevitable, in consequence, that the Public Sector should absorb large amounts of resources in the early years of the Second Plan without any commensurate increase in output: the steel mills were simply not finished.

A Five Year plan normally shows two main sets of figures: targets for the outputs of various commodities which should be attained in the last year of the plan, and plans for capital expenditure to be done in the whole period of the plan. Of these two, the capital expenditure is the thing which calls for direct and immediate action, and it tends therefore to be regarded as the essence of "the plan". This is, however, to mistake the means for the objective: the fundamental objective of the plan is to attain the higher levels of output, and it is these levels of future output which have to be kept in balance as between one product and another, if the plan is to be a coherent one. The capital expenditures are a very important means of helping to attain these outputs, but they are not an objective in themselves; if some other method of raising output could be discovered during the plan period (e.g., by the use of better seeds instead of costly irrigation schemes) then the essence of the plan would be fulfilled, even if the capital expenditure were far below the original figures.

CompleMents and Starts

Given, then, that the fundamental part of a plan is the set of outputs to be attained in a certain year (say 1965), how should the capital expenditure figures be determined? The process is not as direct as is often portrayed, since the output of a commodity (e.g., steel) which can be produced in 1965 will depend on the amount of capital equipment (steel mills) which is in operation in that year. Capital expenditure, on the other hand, during the plan period will largely be devoted to the earlier stages of the production of plants which will not have been completed by 1965, and so will make no contribution to the attainment of the output target; on the other side, some of the new plants which will be working in 1965 have already been begun. In other words, we have to distinguish sharply between

(a) completions of new plants in the plan period, which add to capacity operating at the end of the period;

(b) the amount of investment expenditure which is done during the period—one of it on finishing schemes begun in the earlier period, some on starting schemes to be finished in the next.

In a growing economy, in which the amounts of capital expenditure and of additions to capacity are normally larger in each year than they were in any previous year, the amount of investment expenditure will be regularly greater than the value of the units which are completed.

Besides the concepts of "completions" and "investment expenditure", there are also two more important concepts for planning purposes: "decision" and "starts". In order that the completion may be achieved at the desired date, it is necessary to plan for the projects to be started a suitable time earlier: it is not sufficient to recognise that we shall have to spend capital in order to raise the output, we must recognize that the operation cannot be done in a week or two, but must be started some years in advance*. Furthermore, this will normally require that a "decision of principle" should be taken a good deal earlier still, so that the site may be chosen, plans drawn up, and detailed decisions about the type of plant made; and this in turn means that, if the proposal is to be included in a Plan, it must be put forward for discussion even earlier.

Most Crucial Part of Planning

These "decisions" about starts are in a sense the most crucial part of planning. For sectors with long time lags (e.g., steel, power and plantations) the Third Plan "decisions" must be mainly based on ideas about the output which will be desirable in the Fourth Plan; correspondingly, the upper limit to output

* There may of course be some exceptions to this: a decision to expand the Indian merchant navy might, at the moment, be implemented in a very short time by the purchase of the required number of second-hand ships from abroad. But clearly this case is not typical: even when the capital equipment is to be imported, the order must normally be placed well ahead of time, to allow for the goods to be constructed.
It's all a question of economies... or is it?

In the “good old days,” we are constantly reminded, everything was only a fraction of today’s prices. But a commodity that has risen in price the least is electricity — although people don’t talk about it!

Due to economies in production and distribution, and the use of electricity by more people in more places, the cost of electricity has risen less over the years. Electricity — an abundance of it — is the wish of everyone. And probably sooner than we think, this wish will be fulfilled.

Economics of another kind: For well over 30 years, we have been taking the benefits of electric supply to the countryside, because we have always had ideas and ideals not wholly based on hard cash!

First with ELECTRICITY to the farmer

THE SOUTH MADRAS ELECTRIC SUPPLY CORPN. LTD.

Power House....Tiruchirapalli

Managing Agents: SESHASAYEE BROTHERS PRIVATE LIMITED
in all but the last year or two of the Third Plan is already fixed for such sectors by the decisions which have already been taken and the projects which have already been started. One might even add that the Third Plan is already fixed for in all but the last year or two of projects which have already been taken and the capacity to produce in these sectors has usually got an effective minimum increase during the Third Plan, since projects which have already been started would be unlikely to be abandoned. The scope for freedom of choice about output during most of the Third Plan period is therefore very limited in such sectors, unless one can work plant above normal capacity (e.g., through extra shifts), or decides to work it below capacity.

Perhaps it is useful to sum up this part of the analysis broadly by saying that, for sectors where capital has a long period of construction,

(i) *Starts* are the things which are really decided or planned for each period, by reference to objectives of output in a later period.

(ii) *Investment* (or expenditure) in a period represents largely the "costs" of implementing the decisions taken about starts in a previous period.

(iii) *Completions* in a period represent mainly the fruits of earlier periods' decisions and costs.

(The relationships between the various items may also be seen in the numerical example given in the Appendix.)

THE IMPLICATIONS FOR PLANNING

We have seen above that in some sectors there is a long time lag between the investment expenditure and the harvesting of the fruits; it is also true that these same sectors generally tend to have a fairly high "capital-output ratio"—i.e., to be ones in which the amount of output produced with a plant costing a crore of rupees is rather lower than in the average industry, largely because the plant requires fewer workers to operate it than would be the case in other industries. Does this mean that an underdeveloped country must pay heed to the disadvantages of schemes which have a long gestation period or which give a relatively small amount of output for a given expenditure of scarce capital resources. When it is a matter of comparing the benefits of the extra output with the costs, these two "costs" must certainly not be forgotten. This point is particularly important when one is comparing two ways of producing the same result. Thus extra agricultural output may be secured by major irrigation schemes, or by building fertilizer factories: by and large, the major irrigation schemes should be regarded as less desirable than the other two methods, because of the long time lags and high capital costs, unless the eventual benefits are outstandingly great. One can not, however, argue that as the haircutting industry requires very little capital for a given output and involves very little time lag, therefore capital expenditure should be concentrated on building and equipping barbers' shops.

PREPARING FOR THE FUTURE

In this article I want, however, to concentrate mainly on problems which have received less discussion than the criteria for choice for investment: in particular, I want to emphasise the paramount necessity of taking a long view of the development process, if planning is to be really successful. This means that one must not look only at results to be achieved within the five years covered by the Third Plan; on that basis, one could achieve the maximum increase in output by concentrating almost all investment expenditure on schemes which could be completed within the five year period, leaving nothing in the way of half-finished schemes as a "legacy" for the Fourth Plan period.

Such an extreme policy would obviously be wrong; the growth of the economy should be a smooth and continuing process, which pays no heed to the arbitrary divisions into five-year periods. Indeed, one would expect that each period would leave a bigger legacy to the next in the form of "construction-in-progress" than it received from the previous one.

It is unlikely that any planners would make the mistake of overlooking the future to such an extent as to concentrate exclusively on schemes 'maturing within the five year period. Nevertheless, it is all too easy to fail to include in a plan sufficient work on the very early stages of projects which will take a long time to complete. Immediate needs are so urgent and so large in relation to the scarce resources available, the fruits of such work seem so very distant, and the need for an extra steel mill or power plant six years hence may seem uncertain, when one allows for schemes already started. There is no immediate penalty for failure to start the process now, and it is human nature to postpone such difficult decisions, even though the amount of resources immediately at stake is small.

HISTORY OF INDIAN STEEL

The consequences of such delay may, however, be very serious indeed, as the history of Indian steel shows only too clearly. If one of the new mills had been started early in the First Plan period, it could have produced increasing quantities of steel during India's crisis years, and so greatly relieved the strain on the balance of payments. The strain on n-sources of all kinds involved in building three plants simultaneously would have been reduced, and incidentally the problems and burdens of development would have been better appreciated.

This last point deserve some elaboration. In the First Plan industrial investment was concentrated on schemes which could be rapidly completed. It was quite right, broadly speaking, to get such "quick results" schemes done speedily, just as America's West and South rapidly did war-damage repairs and other capital expenditure which
NOT BY BREAD ALONE...

A man never lives by bread alone. He merely exists. Mere existence is an animal state of life. To live is to grow. Rationally. Sensibly. Usefully. To be useful he needs an occupation. Occupation calls for struggle. Toil. Swear of one's brow.

He and his children also need education. Broadening of social outlook. Feeling of fraternity. A man can live and grow only in a community. The most recent example of life in community is found in Kaira. There are 138 Village Co-operative Societies in Kaira District today. These are affiliated to the Kaira Milk Producers' Co-operative Union Ltd.

There are 40,000 members of the Union. Through their co-ordinated efforts they have built puca roads. Schools. Libraries. Dispensaries. They have electricity and water-taps in their homes. They have the amenities of a civilized life. They have a bright future. They deserve it because they work for it.

Amul — prosperity through co-operation

KAIIRA DISTRICT CO-OPERATIVE MILK PRODUCERS' UNION LTD., ANAND (WESTERN RLY.)
quickly yielded big results. But the exploiting of such opportunities for quick results needed to be combin­ed with the initiation of schemes which required a long time to com­plete, but were essential for continuing development. By neglecting these—which yielded no immediate results—the First Plan period show­ed an apparently creditable record of achievement in relation to out­lay: but it left a very poor legacy for the second, which had to bear all the burdens of constructing the three steel plants whilst reaping no benefits at all until the last year or so. It was inevitable, in consequence that the Public Sector should absorb large amounts of resources in the early years of the Second Plan without any commensurate increase in output: the steel mills were simply not finished.

LONG RANGE ESTIMATE OF DEMAND

This experience also illustrates the inescapable need, in sectors like steel, for making long-range estimates of demand, however hazard­ous this may seem, and the corres­ponding futility of saying that one should "feel one's way". In 1950 there was no shortage of steel in the market which one could "feel", yet it would have been highly desirable to take a decision then to build a steel mill: even so, the prelimina­ry negotiations, reports and the like, plus the construction period, would probably have meant that demand would have grown more than suffi­ciently to absorb its output by the time this began to flow. Converse­ly, there was a very acute shortage in 1957, but this could throw no light on the question whether action was necessary to start a new mill: three were already under construction, and their output would eventually be greater than the 1957 de­mand. To have started a fourth mill under such circumstances would have made the immediate burden on the economy still greater, and could only have been justified if the existing expansion schemes were clearly insufficient to avert an acute shortage of steel in (say) 1963.

If one tries to carry this analysis a little into the future, it may well be that in 1960 or 1961 India will, on bafence, have a surplus of steel for export—assuming that the out­put of the new mills rises accord­ing to schedule. But unless deci­sions about expansion are promptly taken and implemented, deficits would inevitably re-appear in later years. This expansion may largely be done at the existing mills (in­cluding the private ones), sired it costs less to add one million tons of capacity in this way than by starting a new unit: but the existing centres cannot expand indefinitely, and much of the economy of expan­sion (as against new units) is lost if the expansion is done too rapidly. So it may well be that the construc­tion of a new mill should be started very early in the Third Plan period, just when the market seems fully supplied; and this means that the preliminary work must be done be­fore then.

MACHINE-BUILDING

Another example of development which requires a long-range view is to be found in the machine-building industry. If India is to continue her process of industrialization at an increasing rate, and so—despite the growth in her population—make a real impression on her two great problems of poverty and under­employment, she will need year by year to instal ever-increasing amounts of new machinery. In principle, these might largely be obtained from abroad in exchange for Indian exports, but a brief re­view of India's exports shows how unlikely it is that they could be doubled in ten years—which still would not suffice to pay for the ex­tra machinery, quite apart from the need for increased quantities of other imports (materials and com­ponents, oil etc). If India is to become independent of a continued inflow of foreign loans and grants, her continued development will de­pend on a great growth in her own output of machinery.

This is not something of which Indians need feel afraid. In many ways machine-building is a more suitable industry for a large under­developed country to expand than steel-making: it requires less capital per person employed, it can be done in smaller units which can be lo­cated in a greater variety of places, and the more complex machines ran continue to be imported. In India's case the main material, steel, can be produced cheaply in the country—provided that the need is foreseen in advance. It is not a case of artificially introducing an undesirable industry to absorb the steel which the planners have rashly decided to produce: India needs to produce the machinery to make development possible, and in her case "produce should cover both the manufacture of the steel and the fabrication of the machinery.

PENALTY FOR INDECISION

What, then, is the problem? The main problem is to get started on enough projects sufficiently early. Some types of machinery — eg for the cotton and sugar industries — are already made in India in sub­stantial quantities, and one may reasonably hope that capacity for producing them will be expanded in line with rising demand.* But In­dia needs to introduce new types of machine building, so as to cover demands which are now almost wholly met by imports, and in these lines the time-lags are inevitably long: decisions have to be taken not only to instal such factories, but also about details of types of pro­duct, foreign collaboration, scale of operation, location, labour training and so on. Much time may be ab­sorbed in settling the apparently simple question of whether it should be done in the Public Sector or the Private Sector, and if the latter, who should take the initiative: the ques­tion of which country's collabora­tion should be sought, and the negot­iation of the terms, is also one which cannot be rushed. The very fact that the decisions have to be taken so far in advance of the ac­tual commencement of production makes it all the harder to feel suffi­ciently confident about the size and character of demand (say) six years hence.

It is possible, of course, for any one of these difficult decisions to be postponed "until it is possible to assess the position more exactly": India could then continue to im­port the machinery in question—say chemical plant — for a few more years, or she could slow down the expansion of the chemical industry if she could not secure the necessary foreign exchange. But if this hap­pens in too many cases, the process of development will remain essen­tially dependent on further inflow of foreign capital : the Indian economy

*Moreover, in engineering there is much more scope than in steel­making for meeting increased de­mand by working over-time or extra shifts on existing plant. Indeed, double shifts are probably desirable as a permanent arrange­ment.
Planning towards A Better Port

As the life-line of Eastern India's trade and commerce, the Calcutta Port faces recurring problems every year. The emphasis on industrial progress in the Second Five-Year Plan period has considerably changed the type of cargo to be handled. Steel and mechanical equipment, heavy machinery and huge plant form a considerable bulk of the import. On the export front it is coal or ore.

To-day's well-equipped Port needs to be made into a better Port to-morrow. But this is possible not by more equipments alone. The Calcutta Port needs most the whole-hearted co-operation from all fronts,—from those who use and also from those who serve it.

MEN & MACHINES MAKE A BETTER PORT

CALCUTTA PORT COMMISSIONERS

Issued by the Commissioners for the Port of Calcutta
will not cease to function, any more than it did as a result of the delay over the steel mill, but the penalty for indecision will be great.

**REDUCING THE PROBLEMS OF FORECASTING**

So far I have been stressing the need to act on the basis of a long-range view of the future, but it would be absurd to deny that this involves very real problems in making the necessary forecasts. These problems are reduced by the fact that India has an economic Plan, with a fairly clear-cut objective - industrialisation as a means of raising living standards - but inevitably the future still remains uncertain.* What can one do to reduce the risks of major mistakes?

Space permits only a few rather dogmatic suggestions:

(a) *Provisional Doers Jons*

A great deal of the time-lag is often due to the time spent in "preliminaries" - discussion, reports, negotiations, site-choosing, etc. It would be a great time-saver if the broad long-range plan for the economy as a whole were used without elaborate discussion to decide provisionally what output targets should be adopted for 5 years hence and 10 year hence, simply in order to see what projects with long gestation periods would need to be started in the next three years if those targets are to be achieved. The preliminaries could then be undertaken for these forthwith, on the basis that the project should not be started without a confirmatory decision at the date needed for starting the work or placing the orders.

In this way the really important decision would be taken much nearer the date when the product will be actually needed. There will doubtless be some wasted work on preliminaries, since it will be natural for committees to agree on that work being undertaken, as a compromise between the supporters - who want to make sure that the crucial starting date is not missed and the doubters - who do not like being committed to costly schemes based on estimated demand ten years hence, but be prepared to sanction a little expenditure on preliminaries. But the gains from better decisions

{*The experience of the National Coal Board in Britain is a powerful reminder of this.*

and "not missing the bus" should easily outweigh the wasted expenditure on preliminaries for schemes which are then abandoned - quite apart from the fact that many will only be postponed.

(b) *Leaving Room for Expansion*  

It is usually possible to build new steel mills, generating stations and the like in such a way that it is easy to expand them later; above all, such expansion may be a much quicker way of adding one million tons of steel-making capacity than starting again with a new unit.

In the circumstances it is likely to be well worth the extra cost to put up (say) two steel mills with an initial capacity of one million tons "extensible to 2 million tons", rather than to build a single two-million ton mill at the start, or to lay out each of the two plants in the way which is ideal for their existing size, but leaves no scope for easy expansion. Moreover, it is wiser to plan the future development of the industry so that there is always some scope for relatively quick expansion, rather than get all the existing units up to their optimum size before starting another.

(c) *Guarding Against Bottlenecks*  

In the main, the problem is to keep the potential output of the various items in balance with one another - so that the fabricating industries, for example, are not held up for lack of steel, or power, or spare parts. Obviously a perfect balance is impossible, and fortunately there are various methods of mitigating a lack of balance. Thus if an item is in short supply:

(a) the producers may work overtime, and adopt emergency methods to increase output - e.g. sub-contracting, use of obsolete plant.

(b) the item may be imported.

(c) substitutes may be used which are inferior or more costly, but still usable.

(d) stocks may be reduced.

In addition, of course, measures to increase the normal capacity for that item are adopted.

The scope for these remedies varies greatly from industry to industry - notably in the matter of the time to effect a more lasting cure by increasing capacity. Where the scope is small, and the shortage affects important users, there is a strong case for aiming at a slight excess of capacity as an insurance. This applies most strongly perhaps to electricity, which cannot be imported or stocked, but it applies rather generally to items where the plant works 24 hours a day (e.g. steel, soda ash), so that there is no scope for over-time. In a world in which decisions about new plants for these items must be taken on the basis of an estimate of demand several years hence, it is wise to add a margin to one's best estimate; even if that estimate proves to be too high, so that capacity becomes markedly excessive when the plant is completed, the growth of demand will usually absorb the excess in a few years.

**APPENDIX  
Starts, Completions and Investment - A Numerical Example**

The relationship of the various items in a growing economy may be seen from the following very simple example, in which it is assumed:

(a) that it always takes exactly two years from the *start of a school* to its *completion*;

(b) that the number of starts in the 1st year is 10, and that this number increases by 10 each year.

(c) that (for ease of calculation) each year's starts are spread uniformly through the year, and that the work on each school is done uniformly through its construction period.

We then get the picture shown in the table overleaf. That table is really self-explanatory, but we may note the following points (in which the figures for Year O are ignored, as its exceptional features are of no interest):

(1) Starts in a year always exceed completions by the same absolute amount (two "annual increments" of starts), with work done - expressed in equivalents of complete schools - halfway between.

(2) Hence in absolute terms, the growth between any two periods is five-year period is the same for starts, completions and work done.

(3) The figures for schools under construction rise every year - by 20 in pure number, and 10 in terms of completed equivalents.
(4) The number of schools under construction at the end of a year is equal to the number started in that year and the preceding one; the value of construction-in-progress is a little under half their final value (shown as "completed equivalents") being nearly half of the number under construction.

(5) To a close approximation, the value of construction-in-progress at the end of the year equals the value of investment in the year.

N.B. This is an illustration of the general formula that if the period of construction is "n" years, the value of construction-in-progress is approximately \( n \) times the last year's investment.

(6) As a corollary of the above, the increase in construction-in-progress during the period of a five-year Plan is approximately \( in \) x increase in fixed investment between last year of previous plan and last year of this one.

(7) Finally, the last column in the table looks at the matter from the point of view of the industry using the new capital—in this case, the teaching industry. If there was no capital (i.e., plant, buildings etc) in existence before the process of development started, and the 'output of teaching' in a year is roughly proportional to the stock of completed schools in the middle of the year, then growth is as shown. The absolute amount of growth increases every year, although the growth of school-building is the same every year; but the percentage of growth declines.

AH Jet Service to U S
From May 14

AIR-INDIA has announced that it will inaugurate a trans-Atlantic service to New York on May 14. It will use Boeing 707 jet airliners powered by Rolls Royce Conway engines.

The airline has four jet-liners on order and expects to make the first delivery flight from Seattle to Bombay about the middle of next month.

Three flights a week in each direction have been scheduled. Eastbound flights will leave New York every Friday, Saturday and Sunday and westbound flights will originate in Calcutta every Thursday and in Bombay every Saturday and Sunday.

Air-India is the first airline of an Asian country to schedule flights across the Atlantic to the east coast of the United States.

By providing through flights Air-India would provide the fastest air service between India and the United States. The jets would make the connection through London in a little more than 17 hours.

Air-India was the 15th airline to offer Atlantic flights and it aimed at offering a "very personal service". The hostesses would wear the traditional Indian saris, the fabrics in the plane would be hand-woven in India and Indian murals would be on the walls of the plane cabins.

Foreign exchange difficulties which now prevented many Indians from travelling outside their own country would be overcome within five years, the air-line authorities hope.

The Boeing 707 could fly directly between London and Bombay in eight hours but economics dictated that stops be made at intermediate points. Air-India jets would stop on at least one flight a week at Frankfurt, Geneva, Beirut, Paris, Cairo and Rome.

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### Imaginary Example From Social Building

<table>
<thead>
<tr>
<th>Year</th>
<th>Number started</th>
<th>Number completed</th>
<th>Work done</th>
<th>Construction in Progress</th>
<th>Number Available For Use at Middle of Year</th>
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</thead>
<tbody>
<tr>
<td>0</td>
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<td>10(\frac{1}{2})</td>
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</tr>
<tr>
<td>1</td>
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<td>50(\frac{1}{2})</td>
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</tr>
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<td>70(\frac{1}{2})</td>
<td>10(\frac{1}{2})</td>
</tr>
<tr>
<td>4</td>
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<td>30</td>
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<td>90(\frac{1}{2})</td>
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</tr>
<tr>
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<tr>
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<td>150(\frac{1}{2})</td>
<td>310(\frac{1}{2})</td>
<td>10(\frac{1}{2})</td>
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</table>

### Five Year Periods

<table>
<thead>
<tr>
<th>Period</th>
<th>Start</th>
<th>End</th>
<th>Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-5</td>
<td>200</td>
<td>100</td>
<td>150</td>
</tr>
<tr>
<td>6-10</td>
<td>450</td>
<td>350</td>
<td>400</td>
</tr>
<tr>
<td>11-15</td>
<td>700</td>
<td>600</td>
<td>650</td>
</tr>
</tbody>
</table>

* In terms of equivalent complete M.hools.

Notes on Construction of Table

(1) Tin.- numbers started, completed, under construction and available for use follow simply from the assumptions.

(2) The "value" of schools under construction at the end of a year equals \( \frac{3}{4} \) of the number started in the year (since on average building has proceeded for six months out of the two years required) plus \( \frac{1}{4} \) of the number started in the previous year.

(3) Work done = completions plus increase in value of construction-in-progress.
ENGINEERING CHEMICAL PLANTS BASED ON CLIENT'S KNOW-HOW

Here are a few examples of Simon-Carves' ability to combine their long experience of engineering design and construction with the specialised technical knowledge of their clients and to accept responsibility as main contractors for complete industrial plants on a major scale.

India's first 3,500 tons per annum Polyezene Plant at Khoka, West Bengal, set up by the Alkali and Chemical Corporation of India — Simon-Carves were the main contractors for engineering and for detail design and construction of plant and buildings.

Over 40 million lb. of phosphorus from phosphate rock are produced from this factory at Portishead, U.K., every year for Albright & Wilson; Simon-Carves were the main contractors for civil engineering and building and for detail design and construction of plant and buildings.

Two travelling pneumatic unloaders were supplied by Simon Handling Engineers.

The Indian Explosives Factory at Gomia, Bihar, where Simon-Carves were responsible for design, construction and erection of the sulphuric acid and chlorine plant, for construction and erection of the demineralisation and acid blending unit and ammonium nitrate plant, and for erection of the nitric acid plant.

60,000 lb. of carbon black are daily manufactured in this plant by the "furnace process" for Cabot Carbon Ltd. (wholly-owned subsidiary of Godfrey L. Cabot Inc. of USA) at Stanlow, Ellesmere Port, U.K.

Simon-Carves were main contractors for the entire plant on a green-field site.

DESIGNERS, ENGINEERS & CONTRACTORS TO INDIAN INDUSTRIES

Simon-Carves Ltd

Incorporated in England. The liability of the members is limited.

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THE ECONOMIC WEEKLY ANNUAL

January, 1960
Coal is the largest single commodity handled on the Eastern Railway. It is anticipated that, at the end of the second Plan period, out of 7,000 wagons which this Railway will load daily in the busy months, 4,300 will be loaded with coal and the balance with other goods traffic. The Eastern Railway will load five wagons every minute, three of them with coal.

three
coal wagons
a minute