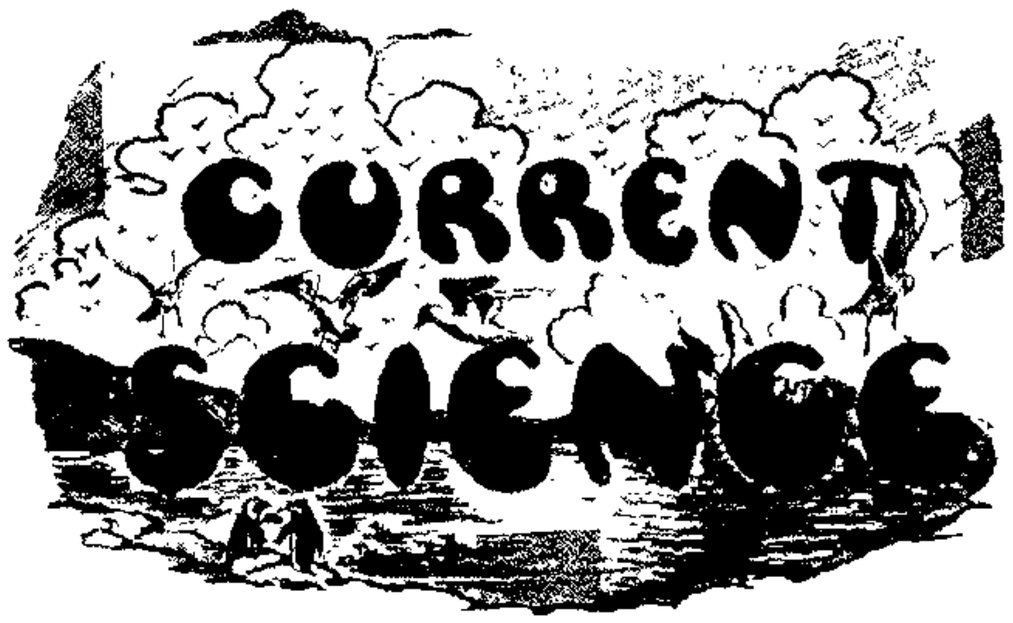

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CONTENTS.

Planned Economy.*

IN his recent vivacious volume, *Scientific Research and Social Needs*, Prof. Julian Huxley has shown us the close linkage between Science and Industry. The Industrial Revolution of the last century was the result of the application to industry of the scientific discoveries of the time, and since then there has been a continuous application of science to industry, on the mechanical as well as on the chemical side. There has been a remarkable spurt during the post-war period in the application of science to economic life, and we are now living through an Industrial Revolution of far greater magnitude and significance to humanity than the earlier one. It has been suggested that the problem of production has been at last solved, and it is now a question of apportioning work and leisure equitably among the members of a community. The problems of Production which were the main concern of the Industrial West in the 19th century are now replaced by problems of Distribution.

Before the community can attend to these problems, it is necessary to face another, *viz.*, the problem of adjusting the economic framework of society to the altered conditions. Science which has affected the methods of industry and its scale has also indirectly influenced social policy. In the early 19th century, when mankind wanted to reap the fruits of the scientific discoveries, economic progress depended on removing the obsolete and vexatious shackles of Mercantilism and excessive State interference, and therefore Industry only wanted the State to stand out of its sunshine. But side by side with increased production and trade, the evils of unregulated Industrialism were making themselves felt, and interference of the State with Industry to ameliorate the lot of the workers became imperative. For nearly a century State intervention was confined to the field of Distribution, without, however, affecting the structure of industry. The problem of wages and the relief of the unemployed were the chief questions that occupied the attention of economists and statesmen, but it is now realised, as has been pointed out by the Director of the International Labour Office, that "the problem of wages has been

* *Planned Economy for India.* By Sir M. Visvesvaraya, K.C.I.E., LL.D., D.Sc., M.I.M.E. Bangalore Press, Bangalore City, Mysore State, British India. Price Rs. 6.

merged in the wider problem of the adaptation of Production to Consumption .... The regulation of labour conditions is no longer so much a matter of protecting the worker against abuse as a part of rational organisation of society." The problem of the hour is to resolve the paradox of Poverty in the midst of Plenty. For, the present economic depression and the widespread unemployment in the World are all due to the fact that we have failed to adopt the organisation of industry to the new phase of mechanical progress which mankind has entered upon without fully realising its social and economic implications. The belief in the powers of self-adjustment of the economic machine has been smothered in the unlifting gloom of the last four years, and there is a growing feeling that the economic life of society must be subjected to conscious collective control. This is the meaning of the demand for Planned Economy.

The question arises whether such conscious collective control should be within the limits set by the present political frontiers, and the State in each country should plan for each as a separate unit, or whether there should not be some approach towards a World Plan. It is a platitude to say that the World has become one, and it has been argued that if the neotechnic economy of the present day is to survive, Industry must be organised on a World scale, and that for two reasons: The first is that the immense advance in the last few years in the means of communication has made physical barriers insignificant and political barriers irrelevant. In the second place, the geographical distribution of the rare earths and metals, which are of supreme significance for the new industrial order, based as it is on Electricity, is such that no country can be independent or self-sufficient. "The basis of the material elements in the new industry is neither national nor continental but planetary, and this is equally true of its technological and scientific heritage."* These facts making for what may be called a long period change happen, however, to be held in check at the present moment by widespread Economic Nationalism with National self-sufficiency for its objective, which is sought to be promoted by hindrances to various kinds of International Trade.

Whether the Economic Organisation of the World is to be unitary, in the sense of a World Plan in which the interests of the parts are rigorously subordinated to those of humanity at large, or a federal one which takes the interests of the parts as the starting point and seeks to reconcile them in a common synthesis, both World Planning and Economic Nationalism have to take account of two tendencies. The first is a continuous reduction of disparities between countries on the economic plane. With the development of automatic and semi-automatic machinery, it is certain that the range of industrial production will rapidly spread even in countries with no previous industrial experience, and it is on this ground that Mr. J. M. Keynes has supported a large measure of National self-sufficiency. Secondly, the basis of modern industry is Power, and the source of power has shifted in the last few years, and it has been argued that "the availability of water-power for producing energy, finally, changes the potential distribution of modern industry throughout the planet, and reduces the peculiar industrial dominance that Europe and the United States held under the coal-and-iron regime. For Asia and South America are almost as well as endowed with water-power—over fifty million horse-power each—as the older industrial regimes, and Africa has three times as much as either Europe or North America. Even within Europe and the United States a shifting of the industrial centre of gravity is taking place: thus the leadership in hydro-electric power development has gone to Italy, France, Norway, Switzerland and Sweden in the order named, and a similar shift is taking place toward the two great social spinal mountain-systems of the United States. The coal measures are no longer the exclusive measures of industrial power."† The combined operation of these two tendencies will bring about a radical change of distribution of the weight of production in the New Order, whether it be cosmopolitan or national in outlook.

World Planning, any more than Economic Nationalism, will not bring peace but a sword, because the advanced countries will be reluctant to surrender their predominance and allow themselves to be converted into 'derelict areas', while the backward countries will be equally determined in their unwillingness to submit

* Mumford, *Technics and Civilisation*.

† Mumford, *op. cit.*

passively to a crystallisation of their present economic status. But the march of events cannot be stayed. "Great economic and social forces flow with ideal sweep over communities only half conscious of that which is befalling them. Wise statesmen are those who foresee what time is thus bringing and try to shape institutions, and to mould men's thought and purpose in accordance with the change that is silently surrounding them" (Morley). India, like other countries, is faced with this problem of reconstruction and adjustment, and it is her good fortune that a statesman of Sir M. Visvesvaraya's authority and learning has given her leaders the fruits of his study, "how best the interests of a backward country like India could be furthered under the complex conditions of present-day civilisation". His work, *Planned Economy for India*, is indeed a tract for the times, but by no means a piece of hurried composition. It represents a slowly-built-up philosophy of life, as well as the results of a life-long study and of strenuous endeavours to enlist the co-operation of his country-men in the task of economic regeneration of their country.

His thesis may be briefly summarised: Economic progress is the pivot round which all other activities revolve, and the spread of the doctrine that poverty is a thing to be tolerated, is a great danger to guard against. At present an overwhelming proportion of the population in India is living below the poverty line. It is necessary that India should be rescued from the double disability from which she is suffering, *viz.*, her chronic economic backwardness, and the acute distress of the present moment as the result of the World Depression. While Indian agriculture should certainly be improved by the adoption of modern methods of scientific agriculture, the centre of gravity of economic reconstruction lies in the sphere of Industrialisation. India needs that a larger proportion of her people should be occupied in industries, and her industrial life should avail itself of mechanisation and mass production methods. These vast changes can only be brought about by the combination of three things: Scientific study of economic conditions with proper organisation of statistics, and an economic survey; creation of institutions, whose purpose will be to study the economic life of the country; and the formulation and operation of a plan of development.

In a Review devoted to the advancement of Science like ours, it is necessary only to touch on what might be called the scientific framework of Sir M. Visvesvaraya's thesis and the manner in which it figures in his important work. There can be no difference with Sir M. Visvesvaraya in his contention that economic activities are the basic condition of higher activities and that poverty is a thing not to be tolerated. There were stages in human history when comfort and leisure were the portion of the few, and hard drudgery the lot of the many. The political centre of gravity has shifted to the masses, who will not tolerate this uneven division of good things in life, while modern science is a powerful ally of Democracy in its demand that poverty shall be abolished for all. If India is to maintain her teeming millions on anything like a decent level of existence, and what is more, if the country is not to become a matter of concern and a menace to the rest of the World, it is necessary that the latest applications of science to agriculture, industry and transport, should be fully utilised so that the volume of production as well as the level of comfort may be raised.

Science is extending its frontiers, and fields of knowledge lying on the margin, or beyond the margin, of scientific study are being brought under cultivation. The life of society itself needs to be brought under the influence of Science, and it is here that the students of Science are under a special obligation to Sir M. Visvesvaraya in his warm belief and vigorous insistence that the facts* and the operations of Indian economic life can and should be subjected to measurement and scientific analysis. Right through his work there is a refreshing appreciation of the value of statistics, and his powerful plea for their proper organisation will surely receive the consideration that is its due. Measurement of social phenomena is yet in its infancy, and in no field of social activities are, perhaps, the need for measurement, and the chances

* Facts are the food of science; if we are going to be scientific about human nature and human society, instead of just trusting to blind social and economic forces (and see what a mess that blind trust has led us into!) let us begin by insisting on a proper supply of facts as grist to the scientific mill.—*Scientific Research and Social Needs*, by Julian Huxley.

of success, greater than in Economics. Economists for a long time were content with qualitative analysis, but in recent years there has been both a recognition of the need for, as well as a growth of, quantitative measurement. Sir M. Visvesvaraya's work is a gratifying indication to the World of Science that we in India are aware of recent developments in this important field of study.

N. S. S. R.

Some Recent Advances in Indian Geology.*

By W. D. West,
Geological Survey of India.

3. The Geology of the Himalaya. †

THE SIMLA-CHAKRATA HILLS.

WE may now consider the second area within the Himalaya which has of late received attention from the Geological Survey of India. In 1925 G. E. Pilgrim and W. D. West began a resurvey of the country between Simla and Chakrata, and were later joined by J. B. Auden. This area had first received attention from H. B. Medlicott so long ago as 1860, and was subsequently the subject of several papers by R. D. Oldham and others. It was Medlicott, however, who laid the foundations of our knowledge of this part of the Himalaya.

A feature of the geology of much of this country, which puzzled Medlicott and subsequent observers, is the occurrence of highly metamorphosed rocks, such as garnetiferous mica-schists and amphibolites, resting on top of practically unaltered rocks, such as the Simla slates. According to Pilgrim and West, these rock groups are not now in their original position relative to one another.[21] Detailed mapping and metamorphic considerations have led them to conclude that the metamorphic rocks, which are really part of the belt of rocks forming the central axis of the Himalaya, have been forced southward for many miles along a nearly horizontal thrust plane, so as to lie now on top of the unaltered rocks. These metamorphic rocks, named the Jutogh series, are seen forming the upper part of the ridge on which Simla is built, the small hill station of Chail, and the greater part of the Chaur mountain south-east of Simla. At the two former localities they occur as true 'klippe', since the effects of denudation have left them as isolated outliers capping the two hills. But the outcrop that forms the greater part of the Chaur mountain continues northwards along a high ridge, and so joins up directly with the main mass of crystalline schists and granites north of the Sutlej river. The Chaur outcrop is thus a direct southward extension of the rocks of the central axis of the Himalaya, and the way in which these metamorphosed rocks extend so far south as a nearly horizontal sheet, overlying the less metamorphosed slate-limestone group of rocks, is one of the most striking features of the geology. In addition to the major thrust plane along which the Jutogh series have travelled, there are other thrust planes in the rocks below, of which the Chail thrust is the most important. The crush phenomena found along the line of this thrust afford evidence of considerable horizontal movement here also. It is possible that the oncoming of the uppermost Jutogh beds like a gigantic wave from the north, induced the formation of the underlying thrusts, the rocks being piled up one on top of the other as a result of great horizontal compression.

Intruded into the Jutogh series there occurs the porphyritic gneissose biotite-granite which forms the upper part of the Chaur peak. This is the same rock as Stoliczka's 'Central Gneiss', and is one of a long series of intrusions stretching from Garhwal to Nanga Parbat. According to Pilgrim and West, the foliation which is found locally in it was developed at the time of its intrusion. Around the granite there is a definite increase in the grade of metamorphism of the Jutogh series, producing very coarse garnet-staurolite-schists, whilst kyanite is sometimes found.

The underlying less metamorphosed rocks comprise a number of series which have been given local names. These include the Chail, Simla, Jaunsar, Krol, Shali, Deoban and Tal series, together with the thin but important Blaini beds, which are now thought to be homotaxial with the Talchir

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† Continued from previous issue, *Curr. Sci.*, 1934, **3**, 231.

[21] *Mem. Geol. Surv. Ind.*, 1928, **53**.