Industrial Planning for Post-War Mysore. By B. S. Narayana Rao, Civil Engineer, Tumkur, 1944. Pp. vi + 16. Price 8 As.

This apparently hastily printed and published brochure of 16 pages (4" × 6" size), with too many spelling and grammatical mistakes, could well be a carefully revised contribution to one of the various scientific and technical journals published in Mysore or outside it in India. It deals all too briefly with several local problems of transport, water supply, fuel, research and finance, and the possible distribution of future industrial undertakings in the State.

M. A. G.

The Indian Cotton Textile Industry (1943 Annual). Edited by Mr. M. P. Gandhi. (Published by Gandhi & Co., Bombay). Pp. 150. Price Rs. 4-4-0.

Mr. M. P. Gandhi deserves to be congratulated for bringing forth the Indian Cotton Textile Industry 1943 Annual with several improvements over its predecessors in spite of the cramping economies imposed by the war. The volume contains valuable and interesting information and statistical data relating to the developments of the industry from all aspects. In discussing the progress of the industry, the author pointedly draws the reader's attention to the post-war prospects and problems facing this premier national industry employing at present no less than 5 lakhs of operatives, over 5,000 University men, with a capital of 49 crores of rupees. A considerable portion of the book is devoted to chronicling the major events during 1943 in the sphere of textiles—particularly the various control orders affecting the industry, the working of the Textile Control Board, introduction of standard cloth, comprehensive price control and marketing of yarn and cloth, etc.,—all of which makes interesting and useful reading.

The book concludes with three appendices. The first one deals with cotton, its cultivation, import and export and the problems India has to face in the matter of short-stapled cotton in the light of the changing conditions in the industry both at home and abroad; the second with the handloom industry and the last gives a list of cotton mills in India. The chapter on the handloom industry is indeed a very informative and thoughtful contribution. The author has made copious extracts from the report of 'Fact Finding Committee (Handloom Mills)', appointed by the Government of India, whose report was published in 1943. With a wealth of revealing data, he has exhaustively discussed the various factors that have affected this age-old but grossly neglected industry and the remedial measures necessary to put it on a sound footing. Handloom industry is, next to agriculture, the largest single industry in the country employing nearly 2½ million men and maintains a population of about 10 millions. Although it may be said to enjoy a short spell of prosperity owing probably to the scarcity of cloth and the several control measures instituted by Government, the author has rightly stressed the Enquiry Committee's recommendation that apart from Government help and co-operative effort, it is necessary to run the industry on businesslike and commercial basis with the active association of businessmen of proved ability and character if it is to flourish and thereby help to revitalize rural life.

There is a short reference to the various minor industries ancillary to the Textile Industry—concerned in the manufacture of healds and reeds, bobbins, shuttles, starches, etc. Mr. Gandhi would do well to create greater consciousness through his publication with regard to the need for stabilising these industries and establishing heavier industries for manufacture of textile machinery.

B. G. R.

CARNEGIE INSTITUTE OF WASHINGTON*

THE travails of war have undoubtedly had far-reaching repercussions on normal life in every land, but it is refreshing to note that in keeping with American tradition, the march of time does not find scientific progress left behind. The publication under review, quite in keeping with national needs in times like the present, relates to the record of researches directed toward the prosecution of war.

The division of plant biology, headed by the physiologist, Spoehr, engaged itself in problems of ultimate utilitarian value. Starting on the premise that plants are the sources of basic food upon which mankind has to live, new avenues are sought for in this direction. In the past, the manufacture of food in the green leaves of land plants has been studied, and to-date, our knowledge of this complex process is fairly clear. Having in view other less-known plant-forms and materials which could likewise be used as probable sources of food, row somewhat naturally, research has been directed to the study of photosynthesis in members of plankton-flora, diatoms, brown and red algæ, dinoflagellates, yellow-green and the blue-green algæ, inclusive of one-celled coloil-yielding regions. A study of photosynthenail algæ. Fossil diatoms have given clues to sis in living ones reproducing under experimental conditions such as those that might have prevailed in former geological ages, throws light on geological formations of the earth.

The classical work of Warburg and Negelein on the one-celled green alga, *Chlorella*, has yielded great many secrets of photosynthesis before. Adopting like technique, twenty species of algæ, diatoms, less abundant Cryptophyceæ, dinoflagellates and blue-greens have been isolated, by micromethods, cultured, and details of photosynthesis studied in these.

By chromatographic adsorption analysis, pigments of *Bacillarieæ*, *Xanthophyceæ*, *Dinophyceæ*, Cryptophyceæ, members of Chlorophyceæ and Phæophyceæ, have been isolated, analysed

* Carnegie Institute of Washington, Year-Book No. 42, 1942–43. (Carnegie Institute of Washington, Washington, D.C.), 1944. Pp. 208.

and chemically studied; likewise, the influence of various factors on photosynthesis has been studied by modern methods. Over 24 plant pigments have been studied, and the majority of components of pigments of the green algæ appear to be identical with those of the higher plants, whereas pigments now studied in members of various groups cited above show wide structural and distributional differences. Based on chemical affinity between several of these pigments, a phylogenetic grouping is attempted.

The effect of various factors, of chemicals like potassium, nitrogen, phosphorus, and of light, on cultured *Chlorella pyrenoidea,* have been studied, and as an overall measure of synthetic activity, instead of assimilatory coefficient, R-values (*i.e.*, degree of reduction of Co_2) have been adopted. The authors claim that these R-values can be experimentally enhanced to 38-50 times the normal in this alga, whereas in green leaves it is not more than 30-40. This means, the food output can be increased. In this way, the experimental study of the modifiability of photosynthesis in pure cultures of these forms opens up new avenues of food sources, and will also lead to a more comprehensive understanding of photosynthesis in the entire plant kingdom than is available now. In that β-Carotene, a component of green pigment, is the precursor of vitamin A, these forms were studied for their sources of vitamin A and vitamin C and the results, tentative now, appear to be hopeful. No literature list accompanies these chapters.

EXPERIMENTAL TAXONOMY

The ever-absorbing question of what is a species, its position as a unit in Biosystematics, its resolution by modern Cyto-genetic methods, the formation of various evolutionary patterns in normal sequence, the role of amphidiploidy in speciation and the ecological adaptability of these in geographic distribution—these are some of the engaging problems with which the section of experimental taxonomy occupied itself within the past year. Amphidiploidy in Madiinæ has been studied and agriculturally useful amphidiploids in *Phleum, Poa* and *Agropyron* have been raised.

PALÆOBOTANY (DR. CHANEY)

The discovery of fossil Cactaceæ and other succulents in mid-Eocene throws light on the origin of arid climate in Pliocene and this is of interest in the reconstruction of topography of early geological ages. A select literature list is appended

DEPARTMENT OF GENETICS

The fact that the war effort of the nation did not make big demands on this department has not by one whit diminished the pursuit of pure research.

Warmke and Davidson continued their investigation on the cytology and breeding behaviour of the *Russian Dandelion.* Anatomical studies of the root revealed a definite and regular increase in latex percentage with increase in distance from the crown. The part of the root used in sampling was, therefore, found to be of great importance for breeding purpose. Artificially induced tetraploids showed the usual complex of gigas characters and efforts are being made to see if increase in root-size is accompanied by increase in rubber content.

The colossal expansion of industry in war-time has brought in its train new sufferings to humanity—one of which is the serious injury to the human eye as a result of constant exposure to ultra-violet radiation. Working on tissue-cultures of neuroblast cells of the grasshopper *Chortophaga viridifasciata,* Kaufmann and Hollaender have found that exposure to ultra-violet radiation of wave-length 2573 Å at an intensity of about 3000 ergs per square cm. per second for periods of only 5-10 minutes will arrest cell division for a considerable length of time. Apparently dividing cells are extremely sensitive to wave-length 2573 Å which appears to cause a blocking of cells in prophase. Ultra-violet radiation differs strikingly from the X-ray effect in the absence of a compensatory period after recovery.

Hollaender, Dmeerec and Sansome have continued irradiation experiments with the fungus *Neurospora* The frequency of X-ray induced mutation increases approximately in proportion to the dosage even when high dosages are employed Treatment with 126,000 roentgens induced about 75 per cent. mutations which is the highest induced mutation rate on record. It is significant that 2650 Å, which is absorbed by nucleic acid to a high degree is the wave-length most effective in producing mutations.

Fano has shown interesting conclusions as a result of his experiments in which sperm of *Drosophila* was treated with neutrons. The frequency of association of lethals and rearrangements appear to be much higher in neutron-treated than in any other material. This is in keeping with the evidence that neutrons as a rule produce fewer gene mutations and more chromosomal rearrangements than energetically similar doses of X-rays.

Through a study of the data on complex rearrangements induced by X-rays Fano concludes that the healing of potential breaks is influenced by mechanical stress that may be exerted through movement of the chromosomes. Potential breaks induced on exposure to X-radiation in the mature sperm of *Drosophila* are not utilised in the formation of new chromosomal arrangements until after the sperm has entered the egg. Since irradiated males may be kept for several days before copulation, a considerable period of time is available between radiation and fertilisation for efforts to alter experimentally the recombination capacity of broken ends of the sperm chromosomes. Such efforts involved exposure of the inseminated females to incubator temperatures of either 18° or 28° C., or to the heating effects of the near infra-red rays. Data assembled indicates that both the near infra-red and 28° temperature give percentages of altered sperms. It would seem that higher temperatures facilitate those chromosome movements which lead to the production of contacts between the broken ends of the chromosomes.

In co-operation with Marinelli, Fano has provided a new calculation to the hypothesis that large ion-clusters are responsible for X-ray induced chromosomal breakage. This super-

sedes the old idea that the absence of any wave-length effect in the genetic action of X-rays should be interpreted to mean that this action is produced by single ionisations or small ion-clusters, such as commonly occur along the paths of photo- or compton-electrons in tissue. Lea and Catcheside (Cambridge-England) used the same argument and calculated that clusters of approximately 20 ionisations ought to be the most effective in breaking chromosomes. Dr. Fano goes further and has calculated that 1 r of X-rays produces approximately 0·1 n clusters per cubic micron.

Mc Clintock has continued her investigations on the breakage and fusion of *Maize* chromosomes. She has evidence which suggests that the capacity for fusion of a recently broken end of a chromosome will be lost if this chromosome undergoes a division cycle before fusion with another such end has occurred. In the course of an attempt to determine the amount of crossing over that may occur within small segments, Mc Clintock found that relatively large amount of crossing over may occur between the loci of two mutants that are physically close to each other on the chromosome.

However hampered by conditions of war, the uniform excellence of researches in 1942-43, and the direction of these to new channels mark a distinctive feature of the work of this mighty institution. In common with former volumes, the get-up is good and presentation perfect.

K. V. S.

COUNCIL OF RESEARCH, UNIVERSITY OF TRAVANCORE

THE Thirteenth Report of the Vice-Chairman (Dr. K. L. Moudgill), Council of Research, University of Travancore, presented to a recent meeting of the Council, is, in the main, a factual summary of the progress of the several research schemes inaugurated under the auspices of the Council. It is not easy even to enumerate within the compass of a brief note the several problems which are under investigation. They cover an extremely wide range from the utilisation of the bitterns of the salt pans to the production of Agar-Agar, and of Titanium white from Ilmenite on the one hand, to a study of Teak defoliators, Gurokini, preparation of vaccines and Development of Fisheries on the other. The Laboratories of the Central Research Institute comprise of Public Health, Applied Biology, Applied Chemistry, Marine Biology and Observatory Sections. The work done in each of these sections is briefly indicated. It is obvious from even these necessarily brief summaries in this Report, that the Council has set before itself an ambitious programme planned with vision and enterprise. The very problems which have been given priority are indicative that Travancore, no less than other progressive communities, has not escaped the ferment which compels the attention of all thoughtful men to tomorrow and the brave new world to be brought into being after the war.

One is naturally tempted to project mentally some at least of these research schemes on to the larger canvas of the all-India research institutions and organisations. The retting of coconut work is a problem in which Travancore is not the only unit interested. Paddy problems are being tackled by the I.C.A.R. on a wider basis. Again, work on the collection and interpretation of meteorological data to serve even purely local needs could easily be made to be much more useful in conjunction with the all-India data. Conversely, the results or even the biproducts of the research carried out in Travancore might well prove to be of significant importance to people outside the State. An illustration, it makes sad reading in the Report, is that although the production of Agar-Agar was successfully initiated and developed by the Council to cover local needs, Travancore could supply but 55 lbs. against a demand of 150 lbs. by the Public Health Department of stricken Bengal. It must be added, however, that the Council have taken steps to avoid such a contingency in future.

It would be of interest and use to the other States and Provinces if the expenditure incurred by the Travancore Council of Research for investigations on so wide a front were given in this Report.

Dr. Moudgill's Report concludes with some very apposite observations on the provision of research and technical personnel to adequately cover the needs of post-war India. He takes note of the dismal possibility that even the facilities for training and research might have to be rationed on a quota basis—so great would be the disparity between supply and demand not only in India but also in Europe and America. He raises the very grave issue whether "formal courses leading to diplomas and degrees have their limitations" in training a technician, "no matter what his status—operative, foreman or leader". He undisguisedly frowns on "our present plethora of publicity, it has become the fashion for people to talk of schemes of research they sponsor and to judge *the worth of people by the number of schemes* of research they sponsor and the number of papers which they publish", and urges "that we should plan attunement of our personnel to our needs of the future". The wish that this part of the Report is brought to the notice of the much wider audience than the one Dr. Moudgill actually addressed does not imply that one necessarily agrees with all the premises and conclusions of the author. Dr. Moudgill concludes with quoting a Chinese proverb, "If you are planning for one year, grow paddy; if you are planning for fifteen years, grow trees; but if you are planning for a hundred years, grow men". *That* needed being said—*and* heard by all the planners.
