able as a captain of finance." The ablest professors in the country would be overjoyed to have a salary equal to that of the higher and more competent business employees, the factory managers, expert salesmen, etc. But by "employees" Mr. Welsh seems to mean "clerks," for in his final sentence he ranks the merit of the average professor below that of the average clerk. That would put the young instructors and the secondary school teachers level with the office boy, and as for the primary teachers would not a German mark be overpayment?

But grant everything Mr. Welsh says. Suppose that the great majority of our faculties are made up of "unselected" weaklings or incompetents who "get all they are worth to the community." The real point remains. Is Mr. Welsh content that such men, cheap men bought for an unskilled laborer's wages, should instruct *his* children? Or is he willing to raise the price and get better men? Or does he consider science and scholarship so unimportant that they can be confidently entrusted to an inferior type of human being?

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A WARNING TO MICROSCOPE USERS

FROM personal experience the writer wishes to warn both the microscope user and manufacturer of the danger of the projecting corrugated rim of the ordinary microscopical eyepiece as an agent for producing an epithelioma in the region of the orbit. This applies especially to the binocular microscope, where it is almost impossible to look through the microscope without scraping a piece of nasal epithelium with the eyepiece. Can any other procedure, if repeated day after day for year after year, be any more favorable for the production of an epithelioma on the side of the nose?

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SCIENTIFIC BOOKS

Mankind at the Crossroads. By E. M. EAST. 8vo., viii + 360 pp. New York, Scribners, 1923.

WE have here a book on "Population" by a biologist. It is devoted to the discussion, in a general way, of the quantity and quality aspects of the population problem.

The argument of the book is to the effect that: (1) Certain processes in present-day civilization are dysgenic due to the fact that it is made easy for inferior types to breed more rapidly than superior types; (2) the present rate of increase of the white race will bring it up against food barriers in about fifty years; (3) many parts of the world—particularly those inhabited by the brown and yellow races—are already so filled that but little further increase can take place; (4) the sensible thing for us to do in the light of these facts is to undertake a thoroughgoing control of population growth, both for the purpose of preventing deterioration in the quality of the stock, and in order to keep numbers down to the point where man may have time and energy for something besides extracting a meager living from the soil.

After a short introductory chapter calling attention to the urgency of population problems, Professor East opens his argument proper by exposition of the biological principles which must be kept in mind in any discussion of population. It is interesting to note that he—a genetic specialist—is far less dogmatic on the question of the inheritance of acquired character than most biologists. "Everything is relative," says the author, and with that belief one can not very well be dogmatic on such a matter. "For all practical purposes," however, the possibility of the inheritance of acquired characters can be disregarded.

His statement of the way in which racial traits have probably developed and the likely results of race crossings is of fundamental importance to the social scientist; while the explanation of the significance of the mechanism of heredity is of great interest and importance to everyone. These facts of heredity urge more potently than any emotional appeal, care in selection of mates. And yet one is not made to feel that breeding superior stock is the sole aim of life, as many eugenists seem to think. After showing that we now have sufficient biological knowledge to enable us to maintain our stock at its present level of ability or, even to improve it, the author wonders whether we have the ability to apply this knowledge.

The rest of the book may be looked upon as an effort (very successful in the reviewer's judgment) to prove that we must undertake in a definite manner to control population growth in the light of clearly established biological principles, and in the light of our knowledge regarding the food supply, if we are not come to grief in the near future. A brief review of population opinions held in the past is followed by a statement of the growth of population in the world to-day, and what this means in terms of increased production of food. The author comes to the conclusion that three times the present population of the world will use up all tillable land, and that when there is this population, the standard of living will be about the equivalent of that of the peasants of western Europe. At our present rate of increase, it will take about a century for population to triple. But, Professor East shows that within about fifty years that part of the world open to Europeans will be so filled up, at present rates of increase, that pressure will become keen and the positive checks—famine, disease, war—will become operative. The chapters on

"Population and Food Supply" and "Permanent Agriculture, Population Restriction and National Progress' will give pause to those optimists, who are so, because they ignore facts. Professor East has done notable service in bringing the pertinent facts together in such concise fashion, and in driving them home with all the force of a very clear style. It is true he asks us to take some of his facts on faith, but the tone of his whole discussion rings true, and those of us who have given some attention to the study of the same matters know that his facts are facts, not guesses or surmises.

The chapter on "Racial Prospects and Racial Dangers" effectually disposes of such inaccurate vaporings as those of Lothrop Stoddard in his "Rising Tide of Color." Here, too, he makes concrete application of what genetics has to teach about race mixtures. His discussion of the race problem in the United States is scarcely convincing, but it deserves attention.

The chapter on the "Rôle of Death in the Drama of Life" seems rather superfluous. Such matter as is germane to the general argument could have been discussed under Public Health. The chapters on Birth Restriction and Public Health and The Birth Rate and Social Progress, drive home the truth that only by properly controlled population growth can we hope to make any real progress in social improvement. Without restriction of birth, we will soon be so driven by pressure upon the limited means of subsistence that no forward movement will be possible, and unless this restriction is directed intelligently, the quality of the people is sure to decline. One may feel less certain of the value of the methods now available for picking out the better stock than Professor East does (mental tests in general, and Army tests in particular) and yet agree with his general conclusion regarding the necessity for intelligent selection.

One is also glad to note that he does not assume that modern medicine and charity have entirely eliminated natural selection from the social process as so many biologists, perhaps one should say eugenists, seem to hold. Selection among men has always had an artificial (social) element in it and this element is not greatly changed in intensity to-day from what it was two or three centuries ago.

Other good points are the recognition of the vital rôle of social influences in individual and group development; the realization that there can never be a sound eugenics so long as the rapid breeding of better stocks to replace poor stocks is its sole aim; the emphasis upon the fact that there is much good ability in all classes of the population; the strong faith in the ability of man to control his own destiny; the consequent belief in the efficacy of education; and the conviction that a high type of family life lies at the root of any sound social order.

It is impossible, however, to do justice to the general excellence of this book by trying to give a notion of its contents. It is easily the best book on the practical aspects of our quantity and quality population problems that has appeared in America. It is written in a clear forceful style which proves that science need not be dry as dust to be truthful. It represents the gathering together of an enormous mass of facts, and such a complete assimilation of these facts that the conclusions may seem too little based on evidence to one unfamiliar with this field. A less thorough assimilation and a less skillful presentation would, however, only have wearied the reader with details, without carrying as much conviction.

It is a book no one interested in social problems can ignore.

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ORGANIC CHEMICAL TRANSFORMATIONS

IT is the belief of the writers that the most important thing in the teaching of organic chemistry is to make the student understand the fundamental relations existing between the different classes of organic compounds. To this should be added a knowledge of the typical reactions which these compounds undergo. Only when he has attained this point of view does he begin to see the truly remarkable order which in reality prevails among the mass of material which is presented to him; and only when he appreciates this order will he make good progress in the subject.

As a result, the charts which accompany this introduction were elaborated, with the aim of presenting these fundamental relations and typical reactions in as concrete a form and as small a space as possible.

In the first or aliphatic series chart, the starting point is the basic hydrocarbon ethane, and from this it is possible to pass to every other compound indicated, by following the arrows. The reagent required to effect each change appears upon the arrow showing that change. Ethane was chosen as the starting point because its derivatives are relatively simple. Methane is not suitable, because the reactions of its derivatives present too many exceptions to the general rules holding for those of its higher homologues. The chart includes methods for passing up and down the series, and references to optical activity, amino acids and sugars.

In the aromatic series chart, the basic hydrocarbon is, of course, benzene, supplemented by naphthalene and anthracene. It is possible to pass from benzene to every other compound shown on the chart. In this series the vast number of important derivatives present a real difficulty, which has been obviated in part