QUOTATIONS

SCIENTIFIC LEADERSHIP IN INDUSTRY

IT is difficult to assess the responsibility of the absence of scientific leadership for many of the grave problems confronting society. Under the conditions of modern civilization, the community in general and not industry alone is dependent upon pure and applied science for its continued progress and prosperity. Under the influence of modern scientific discoveries and their applications in many directions other than industry, the whole basis of society is rapidly becoming scientific, and to an increasing extent the problems which confront the national administrator, whether judiciary or executive, involve factors which require scientific knowledge for their solution.

The Industrial Parliament visualized by Capt. Harold Macmillan, M. P., is an indication of the extent to which the changed conditions of the modern State are bringing us to consider the desirability of reorientating representation on the basis of functional groups in order to link up knowledge and power more effectively in the service of the state and the general interest. Few aspects of civil life, for example, illustrate more aptly the hiatus between knowledge and action than the field of transport. Whether we consider road transport, the railways, shipping, or aviation, the facilities which exist to-day are the outcome of scientific discoveries and their application, and the problems they present to society are in the main due to the absence of scientific organization and control, and consequent development along haphazard lines ruinously expensive to the community as a whole.

In spite of the warning given by the recent Royal Commission on Transport about the absence of vision in such matters and its demonstration of the way in which ignorance and prejudice can bind burdens on the backs of posterity, as with railway development last century, neither in respect of the electrification of suburban services nor in the diversion of heavy goods traffic from the road to rail have any adequate steps been taken to give effect to the recommendations of the Commission, although both these recommendations should encourage employment and the recovery of the railways from their difficult position. In the absence of a more scientific policy, it is still common for a heavy goods lorry to do damage to a road in a few hours amounting to several times the combined value of the lorry and its load.

In other fields we have a number of problems created by industrial wastes. River pollution is becoming increasingly serious as fresh areas of the country are industrialized or the scale of industry increases. The beet sugar industry and the dairying industry provide two recent examples and also illustrate the assistance which scientific research can give in preventing or minimizing the nuisance.

Again, the introduction of oil fuel for steamships immediately created a problem of waste-fuel disposal, and the layman could not have been expected to predict the serious consequences to marine and bird life and to many of our coastal resorts of a policy of dumping waste oil at sea. As in problems of atmospheric pollution, the solution lies almost entirely in the application of scientific methods of prevention and control, and in securing support for a scientific policy designed for the general advantage.

These and numerous similar problems have arisen through society using the results of scientific discoveries unguided by scientific and unprejudiced investigation of their reactions on the life of the community. Many such problems need not have become acute had an elementary amount of such foresight and scientific investigation been exercised in the early stages of the development of scientific discoveries, before the creation of vested interests or the growth of those local prejudices which generally hinder so strongly the development of a rational plan.

There are other wide fields in which the contribution of the scientific worker to the welfare of society is equally important and essential. Notably this is true in regard to food supply, where science is responsible not merely for protecting society against adulteration and for securing the purity of all kinds of foodstuffs, but also for the introduction of fertilizers giving higher yields per acre, for breeding new varieties which enable the zone of profitable cultivation to be extended, and for improved agricultural machinery and methods of cultivating and draining the soil. In addition, scientific research is urgently needed not only in the development and application of new insecticides and fungicides for the prevention or control of diseases or pests in the field, but also to an increasing extent to protect the harvested crops from damage by insect life, fungi, or moulds during storage. The colossal losses caused by insects and moulds to such products as cocoa, tobacco, dried fruit, grain, etc., in storage are as yet largely unappreciated by the public in Great Britain, in spite of the importance of storage space to a country which is so largely dependent upon imported foodstuffs.

In another but related direction, scientific workers are conducting investigations into the changes which occur in fresh fruit, meat, and fish in low-temperature

storage and transport which have already assisted in improving the market condition of fruit, in minimizing wastage during long voyages from overseas, and in improving the handling and transport of white fish so that a larger proportion of the catch can now be landed and marketed fresh than was formerly possible in half the time. The importance of such work in establishing on a firm basis the struggling fishing industry of Great Britain is obvious, apart from its national and social aspect.

Investigations of this type, closely related as they are to the welfare of society, are frequently long-range investigations requiring close cooperation between a number of classes of scientific workers. Only administration capable of taking a long-range and scientific point of view is competent to secure the necessary continuity or coordination, and in few fields is definite planning more important. Problems of food production and preservation should be taken out of the arena of political prejudices and debate into an atmosphere of impartial scientific examination.—*Nature.*

SCIENTIFIC BOOKS

New General Catalogue of Double Stars within 120° of the North Pole. By ROBERT GRANT AITKEN. Two volumes, pages i–lxviii, 1–1488. Carnegie Institution of Washington, 1932.

RARELY has any astronomical publication been so eagerly awaited by a considerable group of scientists as Aitken's new catalogue of double stars, and even more rarely has its appearance so justified every expectation. To say that its value is immense to every active observer or person interested in the theory of the subject is to put the truth mildly.

To those privileged to know R. G. Aitken personally, the ample and generous acknowledgment of the part taken in the inception of the work by the late Eric Doolittle comes as no surprise. As a model of paying tribute to a late colleague it can not be surpassed. In honoring the dead so fully, the author has honored himself.

He tells how Burnham, the author of the great B. G. C., in his last years turned over his data to Doolittle, who in turn tried to carry on the task, always overworking himself and later in failing health. Doolittle in turn made Aitken promise to carry the work to completion, should he have to give it up. His untimely death in 1920 brought this labor to Aitken sooner than the latter ever thought it could be, as Doolittle was not an elderly man at his death.

The work of bringing Doolittle's data up to date and keeping them so, and the untold labor of planning, arranging and preparing the great catalogue and carrying its publication to completion were all borne by Aitken, with able clerical assistance only.

The catalogue itself contains 17,180 doubles. Every double star north of declination −30° discovered and announced up to 1927 is included therein. It is true that most of the old faint Herschel and other similar "doubles" of 10″ and over, which cumbered the B. G. C. to the great handicap of its usefulness, are omitted. But as such "doubles" no longer come within the meaning of the term or have reasonable chance of physical connection, this omission is a vast improvement. Without repeating most of the observations listed in the B. G. C., the discovery measure and one other are usually given. Some measures made before 1905 which were not available to Burnham and all the measures since made up to 1927 then follow in order. The new catalogue becomes therefore both a supplement to and a new and improved edition of the B. G. C.

In the modern observations given as yearly means for single observers, or, in cases of many observers in one year, as combined weighted yearly means, every double star observer can see how his work compares with that of others. Needless to say, this information, never before available in such generous quantity to astronomers of this generation, should be of real value to every one and make the determination of constant differences at last a possibility. Having everything necessary for one star on one page, instead of having to consult two volumes, is also a great convenience. A really useful observing list can now be prepared without weeks of hard labor, as it is easy to see what stars stand in need of more measures. Useless duplication can easily be avoided.

The reviewer has not actually used the tabular matter as yet, so has had little chance to find typographical errors, if such exist. The only thing that has occurred to him as a possible improvement is the insertion of some appropriate letter or symbol to indicate those observations made by photography. While the reviewer is one of the persistent advocates of the accuracy of photographic measures of doubles when they are made on plates taken with refractors of long focus, he has little faith in those made with the astrographic telescopes or others of short focal length, if the doubles are under 5″. As measures on such plates occur in considerable numbers, and also as some observers have published both visual and photographic results, it would have been a help to