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## SOME BASIC CONSIDERATIONS IN PLANNING FOR RESEARCH IN SOUTHERN PROBLEMS<sup>1</sup>

By Professor GEO. H. BOYD

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THERE are so many existing organizations that scientists, as well as others, have long since grown weary of the addition of more organizations with more or less duplication of purpose, more meetings to attend and more papers to be read. Every new organization which is to succeed must justify itself in terms of a distinct purpose and plan of activities. The Southern Association of Science and Industry, organized with the purpose of bringing together science and industry in the South in the effort to focus scientific research upon the problems and the resources of the South, may, I believe, be adequately justified.

<sup>1</sup> Address given before the Southern Association of Science and Industry, meeting in Atlanta, Georgia, April 2, 1942.

This organization has had its beginning under the sponsorship and direction of persons who are prompted by a larger consideration than their own research or the industries which they represent. Recognizing the limitations under which the South is laboring and realizing the opportunities which lie here and the part which scientific research and industry may play in the development of these, they have committed themselves to the task of bringing together the research talents of scientists in this area and the resources of southern industries to contribute what they can toward the building of a greater South. This is a worthy purpose and one which has not hitherto been undertaken in a comprehensive way in the South. Scientific research is capable of making a great con-

tribution to the progress of the South, and so direct is the relation of industry to our whole economic structure that it is particularly promising that science and industry propose to join hands in this effort. We have no thought that science and industry hold the remedies for all our ills, but we believe that the situation which prevails in the South to-day is such that the combined resources of science and industry, concentrated upon the natural resources of the South, can contribute tremendously to its progress.

Since this organization is committed to the application of scientific research to the development of the South and the solution of its problems it would not be out of place to suggest some considerations which seem to be of fundamental importance in our efforts to build for scientific research and its application to the building of the South.

My first suggestion is that our program should be one of *activity*, and not one of mere deliberation. It would seem that southerners have long ago been sufficiently informed with reference to the position of the South in the scale of progress. The South has been told that it is noted for its illiteracy, poverty and backwardness; that its intellectual resources, as well as its soil, have long since been drained to depletion; that it is a fertile field of activity for the political demagogue; that it is the nation's number one economic problem; and other such characterizations, until, no matter how true, there would seem to be little value in continuing to repeat them. No one is more conscious of the shortcomings of the South than are those southerners who are capable of understanding, and those who are not capable of understanding are likely to profit little by the repeated recitation of discouraging facts. For its improvement the South needs a program of activity such as the business man, the industrialist and the scientist can offer, provided they care to combine their efforts to that end. It seems probable that little will be gained by continued talk about the South, but a great opportunity exists for any organization which will go actively and quietly about the job of promoting constructive scientific research in the problems of the South.

It is apparent that many of the difficulties under which we labor in the South are directly related to our low regional income. As was pointed out by Odum in his "Southern Regions of the United States," the South does not have its share of the total wealth of the nation, millionaires are entirely too scarce in this area, and per capita incomes are the lowest in the nation. Many of our leaders in the fields of the social sciences are convinced that the one way out for the South is through the greater regional wealth which can best be attained through industrialization.

If our industries are to develop our natural resources, research must lead industry to these and must

show how they may be developed. This responsibility upon science is a great one and one which will inevitably loom large in the minds of those who view the situation. We must not, however, focus our attention so directly upon that need as to lose sight of other considerations. If we attempt to move too directly and too rapidly toward industrial research and industrialization it seems probable that not only shall industrial research soon find itself barren and ineffective, but we shall fail in our larger motive of creating a healthier, happier and more prosperous South.

If the South is to move forward, and certainly if scientific research is to progress, the general public in the South must become more scientifically-minded and the methods of science must be more commonly followed in the attempt to solve our problems. Thomas Cary Johnson, in his "Scientific Interests in the Old South," takes the position that the "Old South" was very much the same in its attitude toward science as other sections of the country. Despite all that might be said, however, for its interest in natural history, for the popularity of so-called science courses in its colleges, and for the great scientists who may have come out of the South, the primary motive in the old South seems to have been that of broad, general culture; and at no period in its history could the South be regarded as dominated by the spirit of science. The tendency of the modern South too often is that of substituting verbal homage to the achievements of science for real support of productive effort in that field and, even then, science is commonly restricted to the gadgets which technology has produced to make life more comfortable.

It is an oft-repeated statement by scientists that the greatest thing in science is its method. The full meaning of this statement is not always comprehended and few follow this method in all their activities. Even to scientists themselves it is often more of an ideal than a method which is always followed. The statement has meaning, nevertheless, and it is a method which is just as applicable and just as essential in arriving at the truth in matters of social policy as in matters of special scientific research. This method demands that judgments be based upon facts and that judgments, therefore, be withheld until the facts are obtained. It demands freedom. In it there must be no closed doors nor information which must be withheld for the sake of policy or expediency. Its foundation stones are diligence in the quest for facts, honesty and objectivity. It can not countenance dishonesty, deceit, personal bias or looseness. It must be characterized by freedom to move into new frontiers and freedom to abandon ideas which experiment has proved to be untenable.

No human society embodies fully the scientific method, but it is doubtless true that those groups

which have embodied this method most fully are the ones that have attained the most perfect social organization. It seems unlikely that the South or any other region will ever achieve its greatest development until it is willing to abandon personal and social bias, and an unwillingness to face facts and to substitute reason for prejudice as a basis for decision and scientific method for political chicanery in public affairs. Certain it is that scientific research, pure or applied, can never progress much beyond its present state in the South until it has the support of a public which has something of the scientific spirit and method and an understanding of the achievements which its method makes possible.

The task of implanting the aim, the spirit and the method of science in the minds and the activities of the public is one of the important tasks which science and industry must face. It is one of education and one which can not be accomplished in a day. The prevailing traditions of the South which have so commonly ignored science are firmly fixed, and this task will require the greatest patience, skill and perseverance. In this task a great responsibility rests upon science in the understanding and sympathy which must characterize its efforts. Those who are devoted to the traditions of a classical culture dread the approach of science and technology because these seem to threaten the values which they have cherished. Scientists and technologists must accept a large responsibility for this fear because they have so often interpreted science with apparent disregard for human values. If the scientist hopes to be a factor in building a greater South he must never cease to recognize his obligation to the public which supports his efforts—the public which must understand him.

I have dwelt upon this question because I am convinced that, despite the practical importance which the devastation of the Civil War, the collapse of the "Cotton Kingdom" and other misfortunes may have had, the fundamental basis for the present economic and social plight of the South is to be found in large part in the southern attitude of mind, and that herein lies one of the primary tasks which science must face.

Our educational system, and particularly higher education, bears an essential relation to the development of scientific research in southern problems. For inventions and for ideas capable of direct application industry will probably turn primarily to groups of specialized research workers with whom their contacts are intimate. These groups may be located in educational institutions, but in most instances they will probably be in industrial laboratories or in institutes devoted to applied research. In order that the South may reap the greatest benefits from its natural resources it is necessary not only that the industries be located in the South but also that the research relating

to those resources be carried on in the South. Furthermore, it stands to reason that the resources of the South can be best developed by those who know the South and who know those resources through close contact with them.

If institutes of applied research and the industries which look to them are to function adequately, it is practically imperative that they be backed up by a strong system of higher education which places emphasis upon scientific research and which brings its students into an acquaintance with the problems and the resources of this region. The workers in laboratories of applied research must necessarily be furnished from the science departments of colleges and universities and it is natural to expect that a majority of these should, for southern enterprises, come from southern institutions. For this reason emphasis must be placed upon the need for a strong educational system and the essential position of higher education.

The sort of scientific training which our students must have can not be provided by second-rate institutions, and it has been repeatedly shown that we have relatively few institutions in the South which could, by any stretch of imagination, be regarded as approaching the status of first-rate universities. In the past, southern colleges and universities have been very effective in the general culture which they imparted, in their training for certain non-scientific professions such as law and theology and in the quality of students which they have sent into other regions. It is doubtful, however, whether there is a single institution in the South that is giving adequate attention and support to the sciences to enable them to meet their responsibility in the development of the resources of the South and the solution of its problems.

Few people actually realize how expensive graduate work and research in the sciences must inevitably be. In attempting to build for research we must face this fact; for, if we build graduate schools only to the level of mediocrity, we shall have accomplished practically nothing. Both cost and expediency will demand that we attempt to build neither too rapidly nor too widely, but first-rate universities in the South must come, and the cost, even for the South, is not prohibitive.

Many practical problems face us in this attempt. We must be able to attract and to hold able research scholars. The oft-quoted findings of Wilson Gee ten years ago are still substantially true. The South continues to lose to other regions considerably more than it gains from them in research ability. But this is not the only menace to research in the South. In most southern institutions there is too great a tendency to draw capable research men into administrative and committee work. Nothing can be more devastating to

research. If we are to promote research, too great emphasis must not be placed upon administrative positions while too little emphasis is placed upon the activities for which the institution in reality exists. Distinguished service in the form of productive work and inspiring teaching must not be allowed to go unrecognized, but recognition must not consist in moving the able investigator or teacher out of his most effective realm and into administrative circles.

My object in these remarks has been that of pointing out a few of the more general problems which might not receive their just consideration if we hasten to focus our attention too directly and exclusively upon the application of research. I have chosen this course with full knowledge that I could say nothing new or particularly interesting. As regards the work of this association I am strongly convinced that from the beginning our course must be purposeful and our program must be one of activity. It would be my hope that every panel discussion in which we engage may be so thorough and comprehensive as to form a point of departure for some concrete course of action. I am strongly convinced, furthermore, that one of the most effective contributions which this organization may make to the progress of the South lies in the fostering of the scientific approach to problems of public concern, and that scientific research

can do little more than survive in an unscientific atmosphere. If research is to progress it must have the sympathy and support which can come only when the public understands something of its aims, its problems and its possibilities. I am still further convinced that if applied research and industrialization are to make their rightful contribution to the progress of the South they must be built upon a strong educational system. The universities which train men for research constitute the foundation upon which applied research must rest.

It is my sincere belief that if this association can enlist the interest and the cooperative effort of leading scientists and industrialists in this region it may become the greatest single force in the economic and social development of the South. This organization should assume the function of keeping its hand upon the pulse of the South and of giving direction to its scientific and industrial development through the utilization of its resources. The extent to which this association succeeds in assisting in the building of the South through research will depend upon the extent to which the scientific principles of diligence in the search of facts, objectivity, open-mindedness and integrity characterize our methods. Should its efforts cease to be strictly scientific and tend to become promotional in character it will undoubtedly fail.

## COLLECTIVE FARMING IN RUSSIA AND THE UKRAINE. II

By Sir JOHN RUSSELL, F.R.S.

DIRECTOR OF ROTHAMSTED EXPERIMENTAL STATION

THE results of the recent farming efforts in Russia up to the end of 1938 when the last official figures were issued have been: (1) an increase in numbers of livestock so that they had nearly reached the high levels of 1929, pigs indeed had exceeded all previous records; (2) an increase in the area of cultivated land, which fully kept pace with the increase in population; (3) marked increases in the area of fodder and of technical crops; (4) a smaller increase in area of grain crops which represented three quarters of the whole sown area. The yield of cereals per acre is still dependent largely on the season and it is not certain that any increase has occurred; comparison is rendered difficult by a change in 1933 in the method of estimating the yield; American authorities consider that the new method gives estimates about 5 per cent. higher than the old one for one and the same crop.

The grain results for the U.S.S.R. are given in Table VIII.

The villages themselves lack picturesque attractive-

TABLE VIII  
OUTPUT OF GRAIN, U.S.S.R.

	Popula- tion, millions	Total area sown, million ha.	Cereals sown, million ha.	Cereals produced, million tons	Yield quintals per ha.
1913	134	105	94.4	78.8	8.49
1934		131	104.7	88.0	8.54
1935		132.8	103.4	88.7	8.71
1936		133.8	102.4	81.4	8.08
1937	169	135.3	104.4	118.1	11.52
1938		136.9	102.4	93.5	9.28
Increase per cent.	27	30.4	8.5	18	

1 q. per ha. = 0.8 cwt. per acre. Biological estimates introduced in 1933. Average yield of wheat in England and Wales 18 cwt., and of oats and barley 16 cwt. per acre.

ness; usually they are built along a road or sometimes round an open space, but it is always an earth road with no side walk, very muddy in wet weather and very dusty in dry. The cottages are small and very simple, made of local materials, wood in the north, wood or whitewashed adobe in the center and the Ukraine;