

observations which may not be recognized as inaccurate and misleading. It is almost wholly lacking in any quantitative aspects and it is but poorly founded in basic physiologic concepts, but it is the dominant point of view in an incompletely explored field.

In this situation governmental and other organized efforts to protect the public health, as well as the health of industrial workers in trades in which hazards from these materials exist, are doomed to failure through lack of that willing cooperation which springs from general acceptance of the necessity and propriety of regulatory measures. The Kettering Laboratory, up to the present, has been interested chiefly in obtaining information which will serve better to appraise and control the dangers to which industrial workers are exposed. It has become apparent that the accomplishment of this purpose, in relation to certain metals, will depend in large measure upon well founded knowledge of the upper limits of safety in exposure.

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MEMORANDUM

On a Prolonged Experimental Study of the Physiologic Behavior of Certain Metals in Relation to the Public Health.

For a variety of reasons the effects of the absorption of small amounts of lead, arsenic, mercury, tin, zinc, manganese, aluminum and certain other, so-called, heavy metals, upon the life and health of human beings, have assumed an increasing importance in recent years. There is a dearth of accurate information as to the limits within which the absorption of these materials is compatible with normal health, but there is an almost universal belief in their injurious effects, even in minute amounts, which attributed to them mysterious and almost infinitely malignant properties. This belief is based on certain assumptions, and also on many published

the industry recognizes, no doubt, that the physical facilities and to the problem which is under study at this time. On the other hand the above question is raised without any necessary relation

on of this General and fundamental investigation.

this laboratory, through the University of Cincinnati, for the carrying out of this General and fundamental investigation. Now far does it feel justified in making an outright gift of funds to question with the corporations concerned in the growing iron industry. as a condition to further financial support. Nevertheless, I make a with the necessity of demonstrating the productivity and usefulness however, I am quite content to have our work proceed from year to year made available to the University from various sources. For the present, of similar experimental programs in related fields, through funds of the acquisition of useful information, for the permanent endowment of this step. It is my hope that this means may be provided, as a result personnel, and a conservative planning of every successive experiment-

This has led to our investigation of the total natural absorption
 of certain of these metals. Now the time has come in the development
 of our work when the influence of additional increments of these sub-
 stances should be studied. This means prolonged, painstaking, and
 costly experimentation, but the outgrowth of it should be important
 not only from a general scientific viewpoint, but also in relation to
 the present practical problems of the food industry in general, and
 present inefficient industrial hazards. Among other things a sound
 basis for legislative action with reference to tolerances should be
 established.

I have estimated the cost of an experimental program which
 has been formulated in some detail at approximately \$100,000.00,
 distributed over a period of about five years. This cost is based
 on a very standard and cautious increase in laboratory equipment and

the background of information which are making possible our present contribution to their problem have been erected at no expense to it. No doubt, also, the industry expects to receive practical benefit in the form of advice and information which should be of greater actual value than the cost of obtaining it. Finally, the industry, recognizing from its own experience, some of the difficulties that the future holds for it, perhaps, and for industry, in general, may feel justified in making provision for the pursuit of knowledge which should be of inestimable value to industry in general and to the community at large.

Obviously, the short acquaintance which the representatives of the industry have had with the Kettering Laboratory, can scarcely be expected to have resulted in their complete confidence that the results achieved will be commensurate with their cost, or with the expectations described in the preceding paragraphs. The appreciation of such realities makes me hesitant in suggesting a concrete plan until

therefore, is to present what is in my mind as a basis for further thought. It carries no implication that the industry in question is in any way obligated to respond to this idea. In my opinion, here is something worth doing, and in that point of view I describe the opportunity. If the response justifies it I should be happy to present the details of a program of investigation for a period of several years to come. It is my purpose, if possible, to obtain outright gifts sufficient to carry this work to its logical conclusion, so far as it is planned. Such gifts may be made anonymously if it is desirable to avoid public acknowledgment of them. My only interest in the manner of their giving is that there should be no obligation associated with them, excepting as to the general purpose for which they are to be employed, and excepting as to the somewhat more indefinite responsibility for good stewardship and productive effort.

KE 0003204

(Signed) Robert A. Kehoe
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