Harvard and Yale, of Columbia and Princeton, and of Johns Hopkins *sui generis,* fully attest. May they not neglect their privilege and abandon their peculiar work!

What the endowed universities have successfully and naturally done for generations some of the state universities are now attempting against opposition of every sort. How successful, judging only by the test of quality, not of numbers, these universities will be in producing statesmen, jurists, economists and explorers in the fields of pure science, it is still too early to say. To recognize these in embryo, to train these young people for their distinctive careers, is easier for the endowed university than for that of the state, provided only that the endowed university, realizing its privilege and confining its efforts to its special field, does its duty. This, I take it, is the special service which the endowed university can perform, its reason for existence by the side of the university of the state, not copying it, not competing with it, but supplementing it, training leaders.

Their numbers, their courses, limited by their incomes, the endowed universities may remain small with no sense of shame or of failure. The Rookwood Pottery is smaller than many a brick-yard, yet all are needed, all are useful. In the space and quiet of "the yard" or of the quadrangle there is time for reflection, for review, which in the past have led to real contributions to knowledge or to thought. The scholar's life and the scholar's product, not fostered by the conditions of office or consulting-room, may continue if the endowed universities recognize and cherish their high privilege, serving the state and the world with their own peculiar talent, not copying the form or attempting the task of their huge neighbors, not seeing in them rivals but friends. May these allies, realizing their privileges, their distinctive opportunities, win the glories of their recognized usefulnesses!

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RESEARCH ON THE SMOKE PROBLEM AT THE DEPARTMENT OF INDUSTRIAL RESEARCH OF THE UNIVERSITY OF PITTSBURGH

SMOKE exists to a greater or less extent in every city where soft coal is burned. The world at large has not, up to the past few years, regarded it as a waste. It has been considered synonymous with prosperity. Its right to cloud the heavens has been traditional. The enormity of this evil is fast being forced upon the public attention so that the manner in which it is being combated in the big metropolitan centers affords an interesting and profitable subject for study.

Strange to relate, when one stops to consider the breadth of interest and importance of this problem, together with the fact that so many thousands have worked on its various phases, and that so much has been written and is being written on the subject, still no coordinated effort of one group of men has been made to undertake a scientific study of the problem as a whole. One of Pittsburgh's most public-spirited citizens, a man devoted to the city's welfare, recognizing this fact, has established a fellowship of $12,000 per year with the department of industrial research of the University of Pittsburgh for the scientific investigation of this problem.

We have an unpretentious laboratory, designated as the "smoke house," a small, fireproof building, 18 feet wide and 30 feet long, which is situated at a sufficient distance from the main laboratory, so that the smoke in quantities as great as we may need in our work can be made without interfering with the other researches being carried on. In this building there is a furnace, so constructed that it is possible, by varying conditions, to get any kind of coal smoke. This statement may, perhaps, appear peculiar to those who have always considered smoke as just smoke, but our studies

of this subject reveal new properties continually. There are differences in the physical state as well as in the amounts of tar, carbon, ash, etc., in smoke made from different kinds of coal under different conditions of temperature, etc. By means of fans and motors, the smoke can be conducted to various parts of the building, where it can be used for experimental purposes in any manner desired. It is here that the physical and chemical studies are being conducted with the object of learning more definitely just what the various properties of soft coal smoke are, and endeavoring to ascertain new properties which will be of aid in the abolition of the smoke itself.

It is a well-known fact that it is possible to prevent smoke with the accompanying economy of fuel and that there are many forms of furnaces constructed which can be operated with ideal results. The obtaining of men sufficiently intelligent for their proper operation is, however, a problem difficult of solution, for the wages are small and employment far from pleasant. One of the chief aims of our experimental work is, then, to find a means of making the man in the boiler room perform his duty in the best possible manner. A mechanism is being devised, which is simple, practical and "fool-proof," that will automatically warn the stoker in the boiler room that the smoke his fire is making is in excess of the law.

Inquiry is being instituted, in the most accurate manner possible, into the true increase in the cost of living due to the damage done by smoke to the property of the residents of this smoky district. Special stress will be laid upon this portion of the investigation because of the fact that while those who have made Pittsburgh smoky may be large losers by the neglect, they are in all probability not the greatest. Among the list of sufferers upon which the burden falls, we may include dwellings, hotels, hospitals, picture galleries, museums, office buildings, banks, libraries and stores, both wholesale and retail.

The relation of smoke to the health of the residents of a smoky district is one worthy of careful consideration, and one which we hope to be able to put on a more scientific basis than the present.

It is a well-known fact that the lungs of a person dwelling in a smoky atmosphere become coated with soot particles. Does this make him more susceptible to consumption? The question has been answered both negatively and positively by different authorities. From a thorough examination it would appear that Pittsburgh did not have as much consumption as other cities similarly located, where there is much less smoke. Within the corporate limits of the city there is more consumption in the better residence portions, where there is less smoke and dirt than in the more congested district where smoke abounds. On the other hand, catarrh, pneumonia and other so-called "bad air" diseases are very prevalent, due to the irritation caused by the smoke particles. Furthermore, it has been said by some that because of the mucus swallowed in these diseases, stomach trouble is thus indirectly caused by smoke. The eyes are not immune, either. Eye specialists say that the busiest time is after a heavy fog accompanied by smoke.

From the side of æsthetics and the city beautiful, we must take up the effect of coal smoke on buildings and on plants. The botanical side of the question is one of special scientific interest, for while the relation of plants to smelter fumes, etc., has received considerable attention, little if anything seems to have been accomplished or even attempted from the standpoint of the carbon with the accompanying tar-containing phenol and other compounds of a similar nature. It may be of interest to state in this connection that I have found as high as 44 per cent. tar in samples of soot examined. Knowing this, it can well be understood that carbon smoke might have a very injurious effect on vegetation, more especially in spring, when the new leaves are appearing and things being tender are much more readily affected by the toxic action of the soot and accompanying substances.

The meteorological aspect of the smoke problem is being considered. This part of the investigation will, for the greater part, consist

of the application to our local conditions of the methods used in other places.

The smoke problem is not an easy one to handle. There are many obstacles to overcome and many prejudices to set right. Without power to act, knowledge in itself would be of little avail. Therefore the legal aspect of the situation will form no small part of our investigation.

In brief, then, we have in this research the twofold object of scientifically ascertaining the true economic status of the smoke problem in all its phases and the devising of ways and means of making the smokeless combustion of soft coal the rule rather than the exception.

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CANCER RESEARCH

DURING the past winter important developments in the field of cancer research have occurred in New York City which have hitherto escaped public notice. By the addition of $100,000 to the endowment fund of the General Memorial Hospital to be used for the maintenance of 20 free beds for cancer patients, a well-known scientific man has provided the staff of the Collis P. Huntington Fund for Cancer Research with greatly increased facility for the study and treatment of cancer in the human being.

The General Memorial Hospital for the Treatment of Cancer and Allied Diseases was originally chartered for the study and treatment of cancer but at the time of its foundation, cancer had little interest to any one but the surgeon. To-day the wide field of research opened up by the experimental study of cancer is too costly to be undertaken by any hospital without an unusually liberal endowment; and it may be said that no hospital in New York possesses to-day an adequate endowment for this purpose.

The General Memorial Hospital has enjoyed the support of the Huntington Fund for Cancer Research founded by Mrs. C. P. Huntington, since 1902. The trustees of this fund, of which the late Dr. W. T. Bull was chairman, placed the fund at the disposal of Cornell University Medical College in whose laboratories systematic research has been conducted as far as the income of the fund and the resources of the university would permit. Under this arrangement three volumes of studies have been published relating chiefly to experimental observations on lower animals, but the work has been limited in scope by the lack of hospital facilities, and a close cooperation between the laboratories and the hospital wards.

The recent donor, himself a scientist of international reputation, a supporter of cancer research, both here and abroad, and fully acquainted with the proper organization of such work, determined to supply the needs of the Huntington-Cornell staff, and by his liberality has opened a portion of the General Memorial Hospital to cancer research under very favorable auspices. In addition to the endowment of 20 beds, chemical and pathological laboratories are now being constructed in the hospital and a complete X-ray and Radium department is being provided for the early diagnosis and treatment of the disease.

This latest addition to the resources of cancer research is significant in several respects. It is a noteworthy instance of the discriminating support of science by a scientific man who knows exactly what his gift may accomplish. It supplies for the first time in New York City the opportunity for men trained by a university in many branches of medical science to study this disease at the bedside. It enables the pioneer institution founded in the city for the care of malignant disease at last to enter in earnest into the field for which it was established. Incidentally it points out a way for a most effective use of much larger endowments than are even now available. Although a considerable capital is represented in the various branches of this institution, clinical cancer research has been found to be extremely costly, and even the present endowment fails to provide all the important necessities in the work.

Not the least gratifying result is that New York City is now provided with an institution similar to those recently established in