

digest of replies to these questionnaires is expected to be available shortly.

Many firms and universities have offered to cooperate in the research work. Every endeavor will be made to maintain their interest and to assign problems to those universities and industrial laboratories offering to cooperate; due regard being given to the facilities and talent available. A list of research subjects has been compiled, which is given in part below:

1. Recovery of used molding sand through restoring bond to the sand by subjecting it to contact with water vapor under high pressure.
2. The effects of additions of certain chemical reagents upon the physical properties of clays and clayey materials, such as molding sand.
3. Effects of water content on the bond and permeability of a molding sand.
4. Effects of different water per cents. in molding sand on the milling and drilling speeds of light gray iron castings.
5. Research on fusion quality of facings (function of "peeler").
6. Tests of various kinds of clays for restoring bond to molding sand.
7. Comparison of the life of different molding sands.
8. Effects on plasticity of bond in molding sand and reduction of water content when using oil.
9. Effects of wet and dry storing of sand on bonding quality.

The American Steel Foundries Company has permitted a representative of the committee to make a digest of the sand reclamation work carried on by the engineering staff of the A. S. F. and has assisted in the preparation of this digest. Because of the scarcity of steel molding sand of the best quality and the problems arising from having to dispose of large quantities of refuse sand, this company has carried out an extensive investigation of methods of reclaiming the good material which is usually lost, whenever the so-called refuse sand is thrown away. After experimenting along different lines and thoroughly going over methods employed in other plants, a process of reclaiming old sand called "centrifugal scrubbing" was developed.

After establishing the principle of this method, equipment was designed which permits a recovery of about 70 per cent. of refuse sand. Cost figures for 1921 show that a ton of reclaimed sand costs about \$1 per ton against the cost of new sand, at the plant, of \$2.65 to \$3.85 a ton. The process involves cleaning the sand grains of adhering fused material, then separating by air currents the good sand from the bad material. Included in the 30 per cent. loss is some good bonding material which, because of its similarity to bad material, can not be economically separated.

The report covers the theory of sand reclaiming, centrifugal air scrubbing process, cost of reclaiming sand by the latter process, and a description of the proposed sand reclaiming unit.

#### THE BRITISH INDUSTRIAL FATIGUE RESEARCH BOARD

THE second annual report of the Industrial Fatigue Research Board has recently been issued. As reported in the *British Medical Journal* it contains "a comprehensive summary of the chief results obtained by the board since its inception some three years ago. These results have been published in a series of sixteen reports, which represent the output of the board's investigators over a period of about two years, for there is necessarily a considerable delay before the results of the inquiries reach the stage when they are ready for publication. If any critic had doubts as to the value of the board's work, and the importance of its further development on the lines laid down in this report, we think that such doubts would speedily be laid to rest by an impartial study of its pages. They contain a solid body of information which is of direct value to employers of labor, and to welfare workers and factory inspectors; the practical application of this information to the remedy of adverse industrial conditions would produce a very real improvement in the health and efficiency of the workers. In the analysis of published work with which the report opens the various tests of efficiency and fatigue employed are briefly described, and then a more detailed account is given of the results obtained in various indus-

tries concerning output in relation to hours of labor and the duration of work spells and rest pauses. A subsequent section of the report deals with the impersonal physical conditions of the worker's environment, such as temperature, humidity, ventilation and lighting, and the effects of these conditions on efficiency. Personal factors, such as vocational selection and guidance, time and motion study, and the effects of such conditions as seating and clothing, are treated in considerable detail, whilst a shorter section deals with such matters as organization and the relative importance of human and mechanical factors in efficiency. Most of the sections are illustrated by diagrams reproduced from the published reports of the board, and they show at a glance the hourly and daily variations of output observed under various conditions, the effect of regular rest pauses on output, the improvement of output caused by more adequate lighting and by better ventilation, and the value of certain psychophysiological tests in measuring the skill of compositors. The future of the board is said to be full of promise, for, in addition to the investigations already made in certain branches of the textile, iron and steel, and boot and shoe industries, others are now in progress in the laundry and the pottery industries, whilst application has been made to the board by various trade boards and research associations for the institution of inquiries into several other important industries."

#### THE MEDICAL FELLOWSHIPS OF THE NATIONAL RESEARCH COUNCIL

As reported briefly in *SCIENCE* last week, the National Research Council has established fellowships in medicine created for the purpose of increasing the supply of thoroughly qualified teachers in medicine in both clinical and laboratory subjects and in both curative and preventive aspects. The fellowships are supported by appropriations of the Rockefeller Foundation and the General Education Board amounting in total to one hundred thousand dollars a year for a period of five years. Those receiving awards will be known as fellows in medicine of the National Research Council.

To qualify for appointment as a fellow, a

candidate must have the degree of doctor of medicine or doctor of philosophy from an approved university, or preparation equivalent to that represented by one of these degrees. Only citizens of the United States or Canada will ordinarily be appointed, although the fellowship board is authorized to set aside this provision in exceptional cases. The fellowships will be open to both sexes.

Since the principal purpose of establishing these fellowships is to increase the number of competent teachers in the field of medicine, each incumbent will be required to gain experience in teaching. As creative work is regarded as essential to the best teaching, emphasis will also be placed upon research.

Fellows will be at liberty to choose the institutions or universities in which they will work, as well as the men under whose direction they will carry on their researches, subject to the approval of the fellowship board.

Appointments are to be made for a period of twelve months, beginning at any time in the year, with an allowance of six weeks for vacation. The time may be extended, however, if in the judgment of the board the work which the fellow has done justifies it. The stipends are not definitely fixed in amount; but they are intended to enable the individual to live comfortably while carrying on his special work as a fellow.

The fellowships will be administered by a special committee, known as the Medical Fellowship Board of the National Research Council.

Correspondence concerning the fellowships should be addressed to the Division of Medical Sciences, National Research Council, Washington, D. C.

#### INTERNATIONAL CHEMICAL CONFERENCE AT UTRECHT

IN June of last year, Professors Biilmann, Bruni, Ernst Cohen, Donnan, Victor Henri, Kruyt, van Romburgh, Schenk, Walden and Wegscheider met in conference at Utrecht, and agreed to hold there in 1922 a scientific chemical meeting, the date of which is now fixed for June 21, 22 and 23 of this year. The program will consist of several general papers, to-