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THE NATIONAL ROSTER OF SCIENTIFIC AND SPECIALIZED PERSONNEL

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THE National Roster of Scientific and Specialized Personnel is a project of the United States Government, planned to make available in one central office an index of all American citizens who have special scientific or professional skills which may be of importance to the nation in periods of emergency and in normal times.

A somewhat similar register has been completed in England under the sponsorship of the Royal Society. There is no doubt that similar catalogues are available in the totalitarian nations.

The American Roster of Scientific and Specialized Personnel is being developed as a means of recording in an accurate way one of the important areas of the human resources of the nation. It is peculiarly appropriate, therefore, that the national roster is being developed by the federal government as a joint project of the National Resources Planning Board and of the Civil Service Commission. The latter agency is especially concerned in the matter because its executives have seen clearly that the modern advance of scientific and technical specializations has rendered it necessary that the nation should be able to call upon its specialized personnel in an intelligent and efficient manner.

Thus, the fundamental idea behind the new roster is conservation. It is recognized by all that the services of experts may be crucial in preserving the welfare of the nation. A chemist whose work has been done in some specialized and relatively obscure field

Concentrated phenols are known to be good solvents for most proteins. This fact, together with our observation that many complex polysaccharides, such as gum acacia, pectic acid, gum karaya, chondroitin-sulfuric acid, etc., are insoluble in strong phenol solutions, suggested the possibility of the use of phenol in the purification of carbohydrates of bacterial origin. We found that the capsular polysaccharides of most of the types of pneumococci are insoluble in concentrated phenol and may easily be separated from associated proteins by extraction of the latter in phenol; the polysaccharides which are soluble in phenol have been similarly purified by fractional precipitation from phenol solutions by alcohol or glacial acetic acid. (The use of this method in the preparation of the type-specific polysaccharides of pneumococci will be the subject of a separate communication elsewhere.) Applying this method to dried typhoid bacilli, we have obtained a substance, probably still crude in nature, which is highly antigenic in mice.

Acetone-dried organisms of the U. S. Army Medical School strain 58 (Panama carrier strain) were repeatedly extracted with U. S. P. liquified phenol (88 per cent.), or better still, with 95 per cent. phenol, then with alcohol to remove phenol. The phenol-insoluble residue was dried with acetone, then extracted with neutral physiological saline (0.9 per cent. NaCl) or with water; the extract was clarified and precipitated with alcohol or alcohol-ether in the presence of sodium acetate. The precipitate was then subjected to a second phenol extraction, and the alcohol-washing, water extraction, clarification and precipitation were repeated. The final product (substance A) after drying with acetone is a fluffy white powder, which readily forms a viscous, faintly opalescent 1 per cent. solution in water or physiological saline.

Phenol extraction may likewise be used on the product obtained by the tryptic digestion procedure. A tryptic digest preparation, made according to Wakeman,[3] gave a weak biuret reaction; one treatment with phenol removed the small amount of material responsible for this reaction. After clarification of the water extract of the phenol-insoluble residue, precipitation and drying, a product (substance B) was obtained which closely resembled substance A in appearance and properties.

Both substances, obtained in yields of 10 to 15 per cent. of the weight of the organisms, give negative or very faint biuret reactions and very strong Molisch reactions. Their nitrogen contents, corrected for ash and moisture, are 3.4 to 3.6 per cent. Hexosamine, if present at all, accounts for less than 10 per cent. of the total nitrogen. Both substances give strong precipitin reactions with antityphoid rabbit serum.

At least 50 per cent. of 88 white mice injected with two doses of 4×10^{-7} mg of either substance A or B were protected from an infective dose of 5×10^{4} live organisms of strain 58 suspended in mucin. At least half a control group of 40 mice were killed by 10 to 100 organisms similarly suspended. The immunizing doses were given one week apart and the infective dose one week after the second immunizing dose; the animals were then observed one week further. All injections were made intraperitoneally. The phenol-soluble material gave equal protection only in doses 10 to 1,000 times greater.

The antigenic power of substance A at least equals that of material we have prepared by Wakeman's method. Solutions containing 1 mg of active material per ml of physiological saline retain their antigenicity upon passing through a Berkefeld N filter.

Like the products described by others, our antigens were found to be toxic. In preliminary determinations of acute toxicity, a single intraperitoneal dose of 0.4 mg of substance A or B killed about 50 per cent. of 40 white mice within 24 hours. The injection of 0.1 mg under the skin of the abdomen of each of 10 guinea pigs caused a slight reddening and induration over the site of injection lasting one day in one animal and two days in another; the other animals showed no reactions. Intravenous doses of 0.1 mg in rabbits caused the death of two of ten rabbits within two hours and an average maximal elevation of temperature in the others of 2.2° F.

Further reports on the chemical, immunological and toxic properties of these substances will appear later.

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BOOKS RECEIVED

BELGODERE, FRANCISCO JAVIER A. *La Verdad, la Ciencia y la Filosofia.* (Tratado de Euristica Razonada.) Pp. 256. S. Turanzas del Valle, Mesones 97, Mexico.

BENT, ARTHUR C. *Orders Psittaciformes, Cuculiformes, Trogoniformes, Coraciiformes, Caprimulgiformes* and *Micropodiiformes.* Pp. viii + 506. 73 plates. Smithsonian Institution. Superintendent of Documents, Washington, D. C. $0.75.

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