Of the 12 ointments only 3 appear in any of the catalogues, and as many more appear to be in active demand which are not in the National Formulary.

The study is not complete, either in the variety of preparations compared or in the list of manufacturers. But it is enough to show that there are considerable discrepancies between the contents of the National Formulary and commercial demands.

I do not think that commercial demands ought to wholly control the scope of the Formulary. Aside from the fact that there are a number of formulas which should be standardized, yet will have little demand from the manufacturers, the use of formulas must be considered primarily for the retail pharmacist. But the study throws some light, nevertheless, upon the usefulness of the book to a large class of pharmacists who do not make their preparations but purchase from the jobber or manufacturer.

Incidentally it may be noted that two of the catalogues consulted make it a feature of their business to distribute through the wholesale druggists, thus further indicating the line of commercial demands.

The study is recorded in much greater detail than is given above, and may prove of some value in determining the scope of the next edition of the National Formulary.

COÖPERATION IN SCIENTIFIC RESEARCH.

For the ravages and economic difficulties resulting from the world war we may as well extract what comfort we can from reflecting upon the valuable lessons which it has taught us. Indeed, it is more than merely a matter of seeking comfort. If we fail to profit by the experience, so much will be added to the disaster.

Second perhaps to none in importance, among the revelations of the war, are the latent possibilities of coöperation in scientific and technical research. Only those who were directly connected with scientific work in relation to the conduct of the war can fully appreciate the significance of this fact. We are told, for example, that in a single two days' conference of American plant pathologists, by the free interchange of facts and ideas, more progress was made in the solution of the difficult problems of leaf roll and mosaic than would have been secured in five years of scattered individual effort. And this is but one instance of the tremendous gain which such coöperation has brought.

In scientific and particularly in technical research lack of coöperation means not only needless duplication of effort, but incalculable loss through arrested development. It is often the combination of the ideas of two or more individuals that furnishes the solution of a problem. When these ideas are not brought together, they cannot combine. Hence it follows that free interchange of thought accelerates progress in altogether incalculable proportion.

Yet a species of pardonable professional jealousy, or the fear of giving aid to a competitor in trade, has long been allowed to place obstacles in the way of such interchange of ideas. A less self-centered attitude in these matters cannot fail to bring advantage to all. The present economic situation should cause us to give most careful heed to these things.

That part of the increase in the cost of living which is due to monetary causes —to the increase of gold in circulation and to the expansion of credit—is in a sense

not the most serious, for it can be taken care of by correspondingly increased wages. If the cost of living, measured in dollars, were doubled, and wages also were doubled, we should be as well off as before. Real hardship comes only if prices advance at a more rapid rate than wages. Whether this takes place or not depends—aside from unjust operations of monopolists and profiteers—very largely on the productive efficiency of our industries. And we may well doubt whether any one single agency equals, in its latent power to multiply this efficiency, the almost untapped reserve of coöperation in scientific and technical research.—*Scientific American.*

THE DEVELOPMENT OF QUANTITATIVE MICROSCOPY.

BY T. E. WALLIS,* B.SC. (LOND.), F.I.C.

Quantitative microscopical methods are being slowly developed by a small number of isolated workers both in Europe and in America and a certain amount of substantial progress has been made. The subject is now so far advanced that a general review of the situation seems desirable and a free discussion of methods would help those concerned to build upon a sure foundation.

The whole subject is surrounded by so many difficulties that its advocates find their progress hindered by a lack of reliable data upon which to proceed. These fundamental factors are slowly accumulating and can be accepted only when based upon very careful investigations.

The two subjects needing closest attention appear to be (*a*) the limitation of effort to work upon material that promises to yield satisfactory results, and (*b*) the elaboration of a universally applicable method of procedure.

SELECTION OF SUITABLE MATERIAL.

The materials suited for accurate estimation by microscopical counts are limited, at present, to such as contain naturally formed particles of small size such as pollen-grains, starch grains, spores, etc. Such particles are recognizable as intrinsic units that are readily identified by all workers and, when counts are made, they will be satisfied that each one has been working along the same lines.

It is, therefore, to substances containing such particles that one's energies are best directed and it would seem wise to concentrate upon these before attacking the more difficult problems which will involve additional measurements, such as length and area.

In the present state of our knowledge, substances such as sand, powdered sulphur, charcoal and sugar, where the number of particles per milligramme will obviously vary enormously according to the degree of comminution, cannot be successfully estimated by counting methods and it would seem wisest to avoid expenditure of efforts upon such determinations. In the great majority of instances —if not in all—substances such as these can be accurately estimated by chemical and physical methods and this being so, microscopical methods become superfluous. To attempt to make such determinations microscopically tends to bring discredit upon microscopical methods generally.

The counting of fibers and stone cells in a way that will stand severe critical examination and find acceptance among analysts generally is an extremely diffi-

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