the Women's Section would both receive credit. We should know that we were doing something definite. Our Press Committee might go a step further if it seemed best and instead of soliciting papers to come at any time on any sort of subject a special list might be prepared for each month or every three months. Such a list might, perhaps, be published in the JOURNAL or sent out in any other way that seemed best.

This whole notion of mine may be altogether visionary. Perhaps it can't be done. Perhaps it isn't even a good thing to attempt. I have not discussed the subject with anyone but I hope that it will be discussed freely even if the discussion should be mostly criticism. If there is any value in it then others may have better ideas of how it might be carried out.

CHEMISTRY OF THE HOUSEHOLD.*

BY MARY L. CREIGHTON.

The chemistry of the household deals very intimately with many important topics among which are the air we breathe, the food we eat and the best methods of preparing and preserving it, the selection of cooking utensils and their proper care, choice of textiles with reference to "fast colors" and effect of certain dyestuffs upon the fabric, bleaching agents and stain removers, chemical agents for the softening of "hard water," the selection of both toilet and laundry soaps, the problems of artificial light and heat, etc., etc. Under the head of food materials attention must also be given to the character of the various condimental and flavoring agents and baking powders. In fact, the domestic applications of chemistry are so many and so varied that it would be impossible, within the limits of a brief paper, to even refer to them all.

One of the most important subjects which claims attention in the household is the securing of an abundant supply of pure air by means of proper ventilation. We are proverbially careless in regard to providing our homes with an abundance of oxygen—which we know to be as essential as food—but because it may be had for the taking and is not obtained through the medium of the check-book we do not appraise at full value.

Next in importance to fresh air is the food we eat. The principal classes of organic foods are the fats, the carbohydrates—starches and sugars—and the proteids, of which last nitrogen is the essential element. The function of protein is the building and the repair of body tissues, hence animal life can not exist without it. The supply is obtained from lean meat, eggs and some kinds of vegetables.

As a nation we use an excessive amount of protein, a fact which has led to the construction of tables showing those combinations of fats, carbohydrates, minerals, acids and protein which will give most satisfactory results in keeping the human machine up to the highest point of efficiency by meeting its special requirements. The selection of foods must, of course, be governed very largely by circumstances, the industrial worker requiring not only different food materials but a larger amount than the brain worker who takes but little physical exercise.

The scientific training in household science which is now recognized as a factor in the practical education of thousands of young women, and the increasing

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general interest shown in this subject during recent years are hopeful signs for the future, since such a course of study has as its very foundation a knowledge of the chemistry of foods as it applies to their selection and preparation. Never before in the history of this country was such attention paid to the question of foods and food values. We hear constantly of the "balanced ration" and of the necessity for a thorough understanding of the chemistry of foods in order that the body may be well nourished with a minimum of expense.

This subject leads naturally to that other one, What garden vegetables are most profitable from the dual standpoint of food value and money value? Also, what crops are best adapted to certain kinds of soil, and how best can the fertility of the soil be maintained by the replacement of chemical substances which have been removed by growing crops? All plants require a sufficient amount of the elements hydrogen, oxygen, carbon, nitrogen, sulphur, phosphorus, calcium, magnesium, potassium and iron, while still other elements are essential to certain kinds of plant life. The fertility of American farms and gardens must be maintained, or restored, in order to provide the largely increased food supply which the times demand.

We have heard much in the past of "intensive farming," but the summer of 1917 has shown a marvelous increase of interest and enthusiasm in this direction, especially among amateur gardeners. Thus the school boys and girls of to-day are learning in a very practical way that chemistry, instead of being a subject of study to be feared and dreaded, is their strongest ally in the partnership with nature upon which they have entered.

The attitude frequently assumed by students toward this highly interesting and valuable branch of their scientific training reminds one of the story of the small boy who, when walking along a lonely road, saw a ghost-like object ahead which, when bravely approached, proved to be a friendly guide-post.

There are comparatively few lines of work in which a knowledge of chemistry and its practical applications will not prove helpful. In addition, the thousands of so-called school gardens are destined to teach their owners far more than mere soil adaptability and how many crops can be harvested from a small plot of ground intelligently planted and tilled. There will be other lessons of thrift, industry and economy that will prove valuable assets both to the individual and to the community in which he lives.

Following the choice of foodstuffs, the chemistry of cooking deals with the best and most practical methods of preparing the different articles for the table, and necessitates a working knowledge of the nature of the materials to be dealt with and of the object sought in their treatment. This is a subject of such extent and importance as to place it in the front rank of household interests.

The purposes of cooking are, to render food palatable by improving its flavor, to aid digestion, and in general to make it more healthful, the particular method employed depending upon the final object to be attained. For example, a broiled steak retains its juices, while if it is desired to extract them the meat is placed in cold water and cooked slowly.

Of the many different ways in which the winter's supply of fruits is cared for—drying, canning, preserving and the making of jams, marmalades and jellies—the last named is usually considered the most difficult. However, with a proper

understanding of the conditions which must be met, jellies of all kinds may be easily prepared.

Careful experiments have made possible the formulation of certain rules for procedure in the handling of fruit juices. These must contain *pectin*, the constituent upon which the process of jelly-making absolutely depends, and if it is shown by a simple chemical test with ethyl alcohol that pectin is not present it must be supplied.

Fruit juices which are both acidic and rich in pectin, as grape and currant, offer the least difficulty, and for these the old-time method of measure for measure of sugar and juice may be safely employed, the amount of sugar necessary in any case depending upon the proportions of these constituents present.

The bread required for the household is a matter of prime importance, especially the quality of the flour from which it is prepared.

The consideration of the questions of a pure water supply and of pure milk are problems for the community rather than for the household.

A knowledge of the chemical composition of metallic cooking utensils will enable the user to select such as are least liable to corrosion, and also aid in the application of effective cleansing agents not likely to be destructive to the vessel itself.

We have been accustomed to think of graduated glassware as belonging to the equipment of the chemical laboratory, but graduated measuring vessels of glass are now at home in the modern kitchen cabinet. From the sanitary point of view, it is also interesting to note that the glass mixing spoon and glass rolling-pin have largely replaced those made of wood, and that a plate-glass slab now offers a great improvement over the old-time moulding board, while the chances are that pastry prepared on this slab, with an ice-filled glass rolling-pin, will be baked on a glass pie-plate in an oven so constructed that the process is open to inspection.

Many grades of ware, for which we are largely indebted to the chemist's art, find use in the household, from the coarser pieces of stoneware to the decorated china table service of delicate pattern and design. Perfect glazing is a necessity for table ware, and the addition of certain chemical compounds to the glazing material has made possible the varied and beautiful tints now shown in the better grades of porcelain.

While the shortage of dyes formerly imported has been the cause of considerable apprehension, the recent displays of bright-colored fabrics has seemed to be unusually large and indicates that members of the household will not of necessity go clad in sombre garments. And the pride exhibited by the people of the United States in using and wearing, as far as possible, articles "Made in America" goes to show that this country is not likely to take any backward steps along these lines, even should the hoped-for time soon come when it would no longer be essential that we depend upon home manufacturers for the commodities hitherto obtained from abroad.

In conclusion: The chemistry of foods is evidently a subject which has come to stay in the American home, and let us hope that its wise study in our schools and its general application to daily needs will exert an influence upon the public health that shall be lasting in its benefits.