of the material into the stomach and intestine. The determinations were made by adding 0.5 c.c. of blood to 50 c.c. of diluted hydrogen peroxide in a bottle at approximately 22° C. and the amount of oxygen gas liberated in ten minutes was taken as a measure of the amount of catalase in the 0.5 c.c. of blood.

The maximum increase produced in the blood of the liver by the different materials is given in Table 1. It may be seen that the amino acid, glycocoll, produced 56 per cent. increase in catalase, sodium acetate 36 per cent. and acetamid 48 per cent. increase. By comparing the formulæ of these three substances it may be seen that all three are derived from acetic acid; the amino acid, glycocoll, $CH_2NH_2COOH$, and acetamid, $CH_3CONH_2$, being acetic acid, $CH_3COOH$, with an amino ($NH_2$) group introduced into the molecule while sodium acetate, $CH_3COONA$, has the element sodium introduced, hence the conclusion was drawn that the introduction of the amino ($NH_2$) group into the molecule of the organic acid, acetic, thus forming the amino acid, glycocoll, as well as acetamid, was to increase the effectiveness of the acetic acid molecule in stimulating the liver to an increased production of catalase with resulting increase in oxidation. If the introduction of the amino ($NH_2$) group into the other organic acids, propionic, valerianic, caproic, succinic and glutaric, thus forming the amino acids, the essential constituents of protein, increases the effectiveness of these acids in stimulating the liver to an increase output of catalase, this may explain the great increase in heat production after the ingestion of protein.

It may be seen further in Table 1, that the introduction of olein, a fat, into the alimentary tract produced 40 per cent. increase in the catalase of the blood of the liver, glycerine 43 per cent., and potassium oleate 31 per cent. increase. By comparing these figures it may be seen that glycerine produced a greater increase in catalase than did the olein and that potassium oleate produced a smaller increase. By comparing the formulæ of these substances it will be seen that the fat, olein, $(C_{17}H_{33}COO)_3C_3H_5$, has in its molecule a part of the glycerine, $C_3H_5(OH)_3$, molecule and a part of the oleic acid, $C_{17}H_{33}COOH$, molecule. Since oleic acid or potassium oleate produces a smaller increase in catalase than the olein, and glycerine a larger increase, it follows that the effect of the glycerine radical in the olein molecule was to increase the effectiveness of the fat in producing an increase in catalase in a manner similar to but not so extensive as did the amino ($NH_2$) group in the amino acids. It may be seen that the sugar, dextrose, produced a smaller increase in catalase than any of the other substances in keeping with the fact that the ingestion of sugar produces a smaller increase in oxidation than fat or protein.

Evidence is presented in this paper to show that the increased heat production following the ingestion of food is due to the stimulation of the liver to an increased output of catalase, the enzyme bringing about the oxidation and that meat or protein, in keeping with its greater stimulating effect on heat production, produces the greatest increase in catalase, fat next and sugar least. The amino ($NH_2$) group in the protein molecule renders protein, or meat, a more effective stimulant on catalase production and hence on heat production than fat and the glycerine radical in the fat molecule renders fat more effective than sugar.

W. E. BURGE

## THE BUFFALO MEETING OF THE AMERICAN CHEMICAL SOCIETY. II

### DIVISION OF INDUSTRIAL CHEMISTS AND CHEMICAL ENGINEERS

H. S. Miner, *Chairman*

H. E. Howe, *Secretary*

*Symposium on Library Service in Industrial Laboratories*

*The public library in the service of the chemist:* ELWOOD H. MCCLELLAND, Technology Librarian, Carnegie Library of Pittsburgh. The function of the public library is to serve its public by affording information relating to the problems of the

entire community, and since the field of modern chemistry is now so extensive as to find application in almost every line of human endeavor, it is inevitable that the library should have much to offer the chemist. Library service to the chemist should begin *before he becomes a chemist* and should be emphasized during the entire period of his professional education. The professional chemist—especially the man engaged in research or consulting work—can secure valuable assistance from the well-equipped public library. The broader his field, the greater the necessity for using the general library collection to supplement the professional library. The efficacy of the public library is dependent both upon its resources and its "attitude." Satisfactory service to the community assumes the responsibility of maintaining an up-to-date collection; of so administering this collection as to make its resources readily available; of keeping, to some extent, in contact with local technical activities and of keeping thoroughly informed as to the material in his library. Progressive library methods are necessary not only to keep regular readers informed but to bring the library's resources to the attention of professional men and manufacturers who do not habitually use the public library.

*Axioms in the use and abuse of special libraries:* Helen R. Hosmer, formerly of General Electric Co. Now with Dr. Geo. W. Crile Laboratory.

*Methods employed in the industrial library of Eastman Kodak Company:* Gertrude Reissman. The Kodak Park Library was established in 1912 in compliance with a strongly felt need for a general reference center for all involved in research work and manufacturing problems. On account of the nature of work done here, the main feature of the library is the completeness of photographic literature. It contains about 6,000 volumes and maintains subscriptions of about 200 current periodicals. Articles of interest contained therein are abstracted in a monthly publication, the *Abstract Bulletin.* Articles in foreign languages are translated, if necessary, and if the information which had been asked for can not be supplied from the library's own resources, great efforts are made to obtain it elsewhere.

*Relation of the library to industrial laboratories:* W. P. Cutter, The Chemical Catalogue Co., Inc.

*Functions of the industrial library—that of Arthur D. Little, Inc., a type:* E. D. Greenman. In order to keep in touch with chemical literature the chemist finds the frequent use of a library essential. Research investigations are now carried jointly in the library and the laboratory. That the public, college and technical libraries are not sufficiently accessible to quickly supply desired information, has given rise to the development of the industrial library. These libraries serve as storehouses where information is collected, preserved, indexed and distributed. The working functions of an industrial library and its service to the chemist are illustrated by a description of the library of Arthur D. Little, Inc.

*The functions of a research library in the dyestuffs industry:* Julian F. Smith, National Aniline and Chemical Co., Inc. Research Laboratory. The Schoellkopf Research Library, named in honor of the pioneer American dyestuffs makers, is classified according to the Dewey Decimal System. The plan of administration is patterned after the usage of public and institutional libraries, with modifications as required by special conditions. It consists chiefly of literature on pure and applied chemistry, the former predominating, and on engineering and physics. A wide range of other subjects is represented to a less extent. There are great possibilities open for the research library in service to the industries.

*Interior publicity as an aid to the laboratory:* S. M. Masse, National Carbon Co., Inc.

*Long distance library service of the New Jersey Zinc Co.:* L. A. Tafel. Object: To extend library service to any member of the organization wherever located. Organization: Relation to technical department, centralization of library resources, establishment of branch libraries at mines and works. Technical information service: Publication and distribution of the library bulletin.

*Features of the library of Stone & Webster:* G. W. Lee.

*Work of the library of The Solvay Process Co.:* W. L. Neill. The collecting of books and journals for this company began more than thirty years ago. Ours is particularly a special library, mainly on chemical subjects, which contains some 1,200 volumes, including bound volumes of the principal English and German chemical journals. It is in constant use by the staff of chemists. It is indexed on the Dewey system, with the usual cards. We have also, as a second part of the library, files of the principal technical journals, both American and foreign. From these we make abstracts, which are printed and sent out to about 100 men in our employ, one half of whom are in the local office and one half in our other works.

We also circulate among the officials here about twenty of the journals, which are carried out and brought in daily after three days' use.

*Special library service in The Barrett Company:* E. C. BUCK.

*Library service in the chemical department and chemical department laboratories of the E. I. du Pont de Nemours & Company:* F. I. GALLUP. The paper outlined the du Pont Chemical Department Library organization, covering especially the following points: (1) Informing the librarians of new work to be undertaken, (2) a monthly exchange of accession reports, (3) the monthly abstract, (4) the patent files and patent catalogue, (5) special research catalogue of references, (6) classification and index of information in chemical department reports, (7) bibliographical work, (8) personal.

*Symposium on the Future of Certain American-made Chemicals*

*Some present-day problems of chemical industry:* R. F. BACON and W. A. HAMOR.

*A possible menace to American chemical independence:* W. D. COLLINS. This paper noted a few instances of unsatisfactory deliveries of chemicals and apparatus for regular analytical work. In some lines American-made products are so superior to the foreign supplies that very few analysts would care to use the foreign articles at any price. In other lines there is some doubt as to the inferiority of American products available at the present time. Many buyers of supplies for analytical, industrial and educational laboratories would pay higher prices for satisfactory American products, but may not be willing to sacrifice time and reliability of results by using inferior products if supplies formerly used again become available. It is suggested that the industrial section or the society either appoint a new committee or enlarge the field of some committee already in existence to canvass the situation in regard to the quality of chemicals and apparatus for regular laboratory work. Such a committee, working, should be able to secure cooperation between buyers, sellers and manufacturers which would remove any lingering desire on the part of chemists for foreign-made reagents and apparatus for everyday use in the laboratories of schools, universities and industries.

*Quality first to insure increased success of the chemical industry of the United States:* JOKICHI TAKAMINE, JR.

*Phenol:* ALBERT G. PETERKIN.

*Cellulose acetate:* H. S. MORK.

*Unusual organic chemicals:* HANS T. CLARKE.

Also W. J. HALE, L. M. TOLMAN, H. A. METZ and General Information Discussion.

*General Papers*

*Tactical uses of smoke* (lantern): BYRON C. GOSS.

*Chemical work in the canning industry:* W. D. BIGELOW.

*Corrosion tests on commercial calcium chloride used in automobile anti-freeze solutions* (lantern): PAUL RUDNICK. Three proprietary products were tested for their effect on aluminum, copper and cast iron. Polished plates of these metals were immersed in solutions of the concentration directed by the manufacturers. The plates were suspended in pairs of copper and aluminum, copper and cast iron, and aluminum and cast iron, and also a set of all three, by means of copper wire attached to the emergent ends of the respective plates. The tests were continued for thirty days, the loss or gain in weight of the plates being noted every other day. The curves plotted from these results show not only that aluminum is attacked most severely, iron next, and copper least, as would be expected, but also that the rate of corrosion increases sharply on the eighteenth to twentieth day of immersion.

*Oxidation in the manufacture of T.N.T.:* A. S. EASTMAN. The final stage of the nitration of toluene in the manufacture of T.N.T. is carried out at such a high temperature that there is considerable oxidation of the nitrotoluenes, by the mixed acid. The extent of this oxidation is indicated by the presence of 15 to 20 per cent., of $HNOSO_4$ in the spent acids. This represents the reduction product, and it was desired to identify a corresponding quantity of oxidation products. 2-4-dinitrobenzoic acid was isolated. 1.24 per cent. of the toluene is lost by oxidation to organic acids. The gas evolved during nitration contained $CO_2$, CO, $N_2$ and $O_2$ in quantities sufficient to lower the yield of T.N.T. by 4.9 per cent. This gas varies in composition, but may contain sufficient CO to be explosive, causing the top of a nitrator to be blown off, without detonating the T.N.T.

*A new bomb calorimeter for industrial laboratories:* W. L. BADGER. The only feature of this bomb that is radically different from other well-

known types is that it is made of Monel metal and is not lined. The sulphuric and nitric acids formed during the combustion of the coal sample attack the bomb very slightly. Gravimetric sulphur determinations give the sulphur correction directly. Since some of the acids are neutralized by the metal of the bomb, the nitric acid correction can not be determined, but is ordinarily too small to affect the accuracy of determinations for industrial purposes. The result is a bomb which gives results agreeing with the standard types much closer than the ordinary errors in sampling and which can be made for a small fraction of the cost of any lined calorimeter.

*Non-metallic inclusions in steel:* E. G. Mahin. In this paper the origin and nature of inclusions is briefly discussed and the general effects upon the properties of the steel are noted. The principal effects are of two classes: (1) They produce the same kind of weakness as would result from cavities of similar size and form. (2) Ferrite segregation usually occurs in such a manner as that inclusions are found as nuclei of ferrite grains. If the steel is forged or rolled these grains and their inclusions become elongated and ordinary thermal treatment fails to destroy the resulting banded structure. The various theories that have been advanced to account for these facts are discussed, particular attention being devoted to the idea of Stead, to the effect that iron phosphide is entirely responsible for ferrite segregation and that inclusions have a purely incidental connection with this phenomenon. Experimental work is described, illustrated by lantern slides, as a result of which the conclusion is reached that the persistence of ferrite bands is, in fact, largely or entirely due to phosphorus, but that inclusions exert an effect upon the crystallization of ferrite which is independent of the presence of phosphorus. Certain hypotheses are advanced to account for the observed facts.

*Mineral rubber:* Gustav Egloff.

*Manufacture of castor oil:* J. H. Shrader. A description of the technology of castor oil manufacture as practised by the castor oil manufacturers, together with that of the government plant at Gainesville.

*Possibility of commercial utilization of oil from cherry pits, tomato seed and grape seed:* J. H. Shrader. The possibility of the commercial utilization of the canning house by-products of cherry pits, tomato seed and grape pomace is considered in the light of the economic question involved in assembling the raw material before manufacturing the finished product, together with a brief description of the technical questions involved.

*Sugar saving by home-grown sugar beets:* John M. Ort and James P. Withrow. This work was undertaken as a war help, though interest in the subject in rural communities and state institutions has existed for years. In the ordinary manufacture of beet sugar, the sugar is separated from the syrup by crystallization and the sugar then refined. This leaves most of the salts and strongly flavored organic impurities in the residual impoverished syrup of molasses so that it is fit only for cattle food or fertilizer. It is this material also which has rendered difficult the elimination of the beet flavor from the syrup from sugar beets. Otherwise the making of this syrup for home consumption would long ago have been an important rural home industry. Home cultivated sugar beets properly trimmed, peeled, decored and sliced were found to yield a bright syrup with good taste upon treatment with hot water after a preliminary wash and then boiling down. This gives a sweetening available for many culinary purposes and in which, with ordinary care, the characteristic beet flavor is nearly eliminated or not too prominent for use as syrup. Contrary to the published statements no simple treatment has been found which will consistently render this syrup entirely palatable but it can be used in all cases with as little real basis for objection as the sorghum syrup so much made in rural districts. It is hoped that more resourceful investigators will succeed in the entire elimination of this disagreeable flavor, and in every case. We have but dipped into the subject.

Charles L. Parsons,
*Secretary*

(*To be continued*)

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