of the War Metallurgy Committee to be the repository for such suggestions and ideas, it recognizes as a very definite part of its war-time job the appraisal of such of these problems and possibilities as are referred to it by the War Production Board or the Office of Scientific Research and Development.

Another important function of the War Metallurgy Committee is to digest and make available to those properly interested through their participation in the war effort the results of both Canadian and English metallurgical research. Obviously, both Canada and England have a great many of the same problems which confront us in this country and the interchange of information, through the proper channels, makes available to all the best thinking and practice of scientists and industrialists on both sides of the Atlantic.

Typical of the problems referred to this committee is one asking for improvement in welding processes. A subcommittee was immediately appointed, which collected all available known data from universities, engineering foundations and research departments of business organizations. The Project Section of the War Metallurgy Committee worked up the research indicated, research procedure, and, with the approval of National Defense Research Committee and the Office of Scientific Research and Development, this research was placed with one of the university laboratories and compensated for on a cost basis from funds made available by the Office of Scientific Research and Development.

The time involved in such research projects naturally varies. The report of the subcommittee, on many such projects, is made available within a matter of days, but the project itself may take anywhere from two to six months, depending upon the nature of the research.

Typical of requests for data and projects from the War Production Board is that of the effect of substitution of lead-silver for tin-lead soldering of tin cans used for food products. Since tin is the one important metal which is not found in the United States, even in low-grade ores, it is obviously important that the conservation of the present use of tin is urgent.

Since a great proportion of the total consumption of tin is used in soldering, the substitution of lead-silver for tin-lead soldering is immediately dictated, but the problems involved, in certain canning processes, are such that definite research is needed before such substitution can be ordered.

This research project was prepared through the Project Section of the War Metallurgy Committee and will be administered through its research section, the work being done in one large university research laboratory, in cooperation with the National Canners Association.

SPECIAL ARTICLES

ABSORPTION OF VARIOUS ALCOHOLIC BEVERAGES

IT has long been known that different alcoholic beverages are absorbed at varying rates.[1] Haggard *et al.*[2] have suggested that this may be due to differing buffer capacity.

To investigate this problem, alcohol, Scotch and Bourbon whiskeys, gin and California Port and Burgundy wines were given to two subjects, the final concentration ingested being in all cases 13 per cent. alcohol by volume. The dose in the case of subject A equaled 0.95 gm of alcohol per kgm, in subject B 0.75 gm per kgm. Ingestion was completed, on an empty stomach, in 10 minutes. Venous blood was analyzed for alcohol content.[3] Table 1 shows the maximum alcohol concentrations, the times these occurred and the rate of increment in the first 30 minutes.

In subject A there was a clear-cut difference between the wines and the distilled liquors, the latter being absorbed more rapidly with attainment of a higher maximum. Subject B showed no such difference. He had a distinct aversion to the distilled liquors, resulting in mild nausea, and the explanation offered is that disturbed gastric motility interfered with their rapid absorption. That the two subjects showed no difference in normal gastric motility was demonstrated radiographically after ingestion of colloidal thorium dioxide.

TABLE 1

Subject	Beverage	Maximum Concentration	Time of maximum	Rate of increase first 30 minutes
		mgm per cent.	min.	mgm per cent. per min.
A	Scotch	162	45	5.4
	Alcohol ...	155	45	5.0
	Gin	158	45	4.1
	Bourbon ..	153	45	4.0
	Port	135	120	1.9
	Burgundy .	120	90	1.3
B	Scotch	92	45	2.7
	Alcohol ...	90	75	2.6
	Port	106	60	2.4
	Gin	97	75	2.3
	Burgundy .	85	60	2.0
	Bourbon ..	91	90	1.6

[1] E. Mellanby, Nat. Res. Council (Great Britain) Special Report Series Number 31, 1919.

[2] H. W. Haggard, L. A. Greenberg and L. H. Cohen, *New Eng. Jour. Med.*, 219: 466, 1938.

[3] H. W. Newman, *Jour. Pharmacol. and Exp. Therap.*, 56: 278, 1936.

The initial high peak of alcohol concentration shown by subject A, seen in Fig. 1, is characteristic of rapid

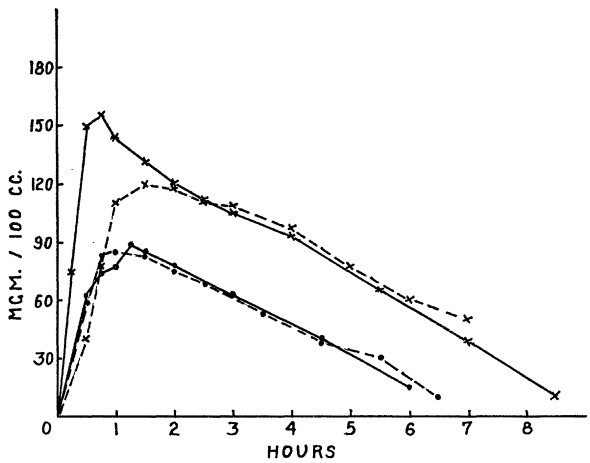

FIG. 1. Blood alcohol concentration following ingestion of diluted alcohol, as shown by the solid lines, and California Burgundy wine, shown by the broken lines. The upper curves are those of subject A, the lower curves those of subject B.

absorption, with failure of equilibration to keep pace. This is notably absent in this subject after the wines.

The same dose of alcohol was again given to subject A, but this time it was buffered to the same pH and buffer capacity as the Port wine. In this case the blood alcohol curve was practically superimposable on that after Port wine, and bore no resemblance to the curve obtained after alcohol alone. Thus there can be no doubt that the slower absorption of wine than distilled liquors is ascribable to its buffer capacity.

CONCLUSIONS

Wines, with their high buffer capacity, are absorbed less rapidly than distilled liquors. This results in the absence of the high peak of blood alcohol concentration seen after ingestion of distilled liquors on an empty stomach. In certain individuals, nausea may so disturb gastric motility as to obscure this difference.

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THE PRODUCTION OF A PRESSOR SUBSTANCE FROM SERUM GLOBULIN BY ACTION OF PEPSIN[1]

THE recent article of H. Croxatto and R. Croxatto[2] has led us to publish some of the work upon which we have been engaged since May, 1941.

The demonstration by Braun-Menendez[3] and others that renin behaves like a ferment led quite naturally to the further study of its ferment-like properties. The discovery by Page[4] that the incubation of blood serum with renin produces a pressor substance, which unlike renin is thermostable, has increased still more the interest in renin and the hypertensive substances which may be formed from or by it.

Our own work followed two lines of investigation. In the first series of experiments, renin was added to various known constituents of serum and the hypertensive effects of the solutions studied on the dog. The substances employed were urea, creatin, creatinin, tyrosin, glycine, histidine, alanine and uric acid in normal saline solution. After incubation for fifteen minutes, the renin solution's activity was destroyed by immersion in boiling water. None of these solutions showed any hypertensive effects. Sheep serum globulin, by contrast, when subjected to the same treatment uniformly gave rise to a pressor substance, called "angiotonin" by Page and "hypertensin" by Braun-Menendez.

In our second series of experiments we studied the effects of various enzymes on serum globulin. We employed trypsin, papain, cathepsin, takadiastase and pepsin. The only positive results were obtained with pepsin, and these results were at first very inconstant. During the past ten months' study of the properties of the pressor substance produced by the action of pepsin on serum globulin, we have learned how to produce this pressor substance with relative ease.

In our experiments we have employed four different commercial preparations of pepsin. The results were identical with each preparation. We have not yet had an opportunity of studying the effect of crystalline pepsin on serum globulin.

The most active pressor substance is produced by incubation between pH 5 and 6 for one-half hour. When more acid reaction such as pH 5, 4 or 3 were employed, the resulting solution was only feebly hypertensive or inactive, or in some instances strongly depressor, possibly because of peptone-like substances, the result of peptic digestion. This observation is in harmony with the fact that pepsin in an acid solution destroys "angiotonin." Incubation for one-half hour produced a much more active preparation than incubation for a shorter length of time.

When the solution of pepsin was immersed in boiling water for ten minutes before addition to serum globulin, no hypertensive substance was formed. Although the hypertensive substance was formed at pH 5–7, it was apparently necessary to dissolve the pepsin

[1] From the Hixon Laboratory for Medical Research, University of Kansas, School of Medicine, Kansas City, Kansas.

[2] H. Croxatto and R. Croxatto, SCIENCE, 95: 101, 1942.

[3] E. Braun-Menendez, J. C. Fasciolo, L. F. Leloir and J. M. Muñoz, *Jour. Physiol.*, 98: 283, 1940.

[4] I. H. Page and O. M. Helmer, *Jour. Exp. Med.*, 71: 29, 1940.