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ANALYTIC NOTES ON LIQUID MALT-EXTRACTS.

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FROM brief notices in recently-issued text-books as to the employment of malt-extracts, it appears that the leading therapeutists are not favorably impressed with their usefulness. Nevertheless, if one may judge by the variety of brands now in the market, and by the extensive displays occasionally seen in the show-windows of drug-stores, it must be inferred that either physicians are very liberal in prescribing these preparations or the public has acquired a strong tendency to their use.

It seems advisable, therefore, to make some comparative analytic determinations and some inquiry as to how far any useful physiologic effect may be obtained from them. The primary motive leading to their employment is doubtless to secure the starch-digesting power which is active in malt, due, as is well known, to the enzyme diastase. This body is, however, somewhat sensitive to chemical influences. Its activity is quickly destroyed at certain temperatures, and suspended, if not destroyed, by many substances of the antiseptic class.

It has not been deemed necessary to include in the examination the solid or semi-fluid extracts. These

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possess diastatic power, are free from objectionable ingredients, such as alcohol or salicylic acid, and by their very nature are not likely to be used except under medical advice. The extracts prepared by the Maltine Co., Parke, Davis & Co., and the Trommer Malt Co. possess decided starch-converting power, and evidently contain notable amounts of diastase. The liquid extracts are mostly alcoholic, so that there is a factor in their use that has sanitary as well as medical importance.

No.	Brand.	Claims.	Alcohol.	Solid ext. grms. to 100 c c.	Salicylic acid.	Diastatic effect.
1	Blair's	No alcohol	None	16.06	None	None.
2	Evans's	Less than 4 per cent. alcohol	3 per ct.	5.35	"	"
3	Dukehart's	No alcohol	Present	25.22	Present	"
4	Genois's	Less than 4 per cent. alcohol	6 per ct.	15.4	None	"
5	Wyeth's	Less than 3 per cent. alcohol	2.98 p. ct.	14.1	"	"
6	Malt-Hopine	.....	Present	8.97	Present	"
7	Hercules	.....	"	10.23	None	"
8	English	Rich in extractive	"	5.24	"	"
9	Wampole's	A trifle over 4 per cent. of alcohol.	7.7 per ct.	12.89	"	"
10	Standard	Absolutely free from alcohol	3 per ct.	9.58	"	"
11	Tarrant's	.....	Present	10.24	Present	"
12	Johann Hoff's	.....	"	8.44	None	"
13	"Trade"	Highest per cent. of extract and lowest of alcohol of any malt extract in use.	3 per ct.	5.1	"	"

The foregoing samples represent, I believe, the principal brands of liquid malt-extracts sold in Philadelphia. They were obtained for me by a retail drug-house of excellent standing, and were all in unbroken packages, in good condition. I learn that at least one of the larger breweries makes a malt-extract which is furnished to retail druggists in quantity, with a label bearing the druggist's name. I have designated this as "Trade" extract (No. 13). It apparently finds considerable sale.

The foregoing table does not require much comment. It shows that in three of the brands, Dukehart's, Malt-Hopine, and Tarrant's, a most objectionable ingredient, salicylic acid, is present. This substance, apart from the fact that the commercial article is decidedly poisonous by reason of impurities, is especially objectionable in a malt-extract, for it interferes with several of the digestive ferments. Three of the brands, Blair's, Dukehart's, and Standard, make a special claim for freedom from alcohol, but only the first-named justifies this claim. The claim for richness in extract is seen also to be not substantiated in the two cases, English and "Trade," in which it is made.

As might be expected, no diastatic power was observed in any of the samples. For an exact determination of relative diastatic power it is necessary to make conversions under strictly analogous conditions, in the presence of excess of starch, and measure the sugar formed; but for the determination merely of the presence or absence of active diastase a qualitative test suffices. It was found that with each of the liquid extracts several hours' action at a

moderate temperature was insufficient to convert even very small amounts of starch. In some instances measurements were made of the sugar, and it was found that none was formed by the action on starch, the Fehling figure for the liquid after treatment with starch being the same as that before treatment. As in the case of one of the samples, "Standard," such positive claim is made—the advertisement stating that it is "absolutely free from alcohol"—two samples were tested, and alcohol was found in both.

It is apparent from the foregoing assays that the liquid malt-extracts are mostly beers, that they have but little if any value as either food or digestives, and that several of them are positively injurious. It is a fitting commentary on the situation to note that of two most distinguished American authorities on therapeutics, one recommends that malt-extracts should be given before meals and the other that they should be used after meals. It is worth while noting that as substitutes for beer these extracts are not economical.