
SYNOPSIS
and
BIBLIOGRAPHY

S Y N O P S I S

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Diagnosis of drunkenness is arrived at by combination and correlation of interrogation, physical examination and bio-chemical analysis. For administration of law and justice, however, blood alcohol concentration has been universally accepted as the best bio-chemical index of drunkenness. Bio-chemical index of alcohol intoxication has a special significance in India, where drinking is prohibited by law. Laboratory determination of blood alcohol is a most, if not the most, delicate assignment in medico-legal laboratory practice. The problem is complicated, inter alia, by volatile intrinsic interfering metabolites like aldehydes, ketones, organic acids etc as are harboured in normal circulating blood. To this factors should also be added other extrinsic sources of interference that might have their origin in laboratory atmosphere.

atmosphere (in which blood test is conducted) and/or in the reagents (used for the test).

2. In the position as above, the ideal method for determination of blood alcohol concentration should be one that includes precautions to exclude the intrinsic sources of interference (i) as well as extrinsic sources (ii) referred to above. Amongst the toxicological methods and their innumerable modifications hitherto developed for the purpose, only a few have excluded the intrinsic source of error (i). If 'every advance in Science is advance in method', none of the previous workers has made further advance in the matter of total elimination of extrinsic sources of error (ii) beyond putting forward mere theoretical suggestion that the laboratory must be clean and dust free, and the reagents of the recognised reagent-grade reagents. No precaution or inadequate precaution to exclude extrinsic sources of error appears, therefore, to be a palpable lacuna in the current toxicological methods and their modifications as developed by previous

by previous workers. This is a void that has sub-
-jected the author as expert-in-witnessbox to seri-
-ous challenge from the legal profession and the
judiciary. Leaving aside such challenge, the scien-
-tific opinion would not certainly be polarised on
the fundamental point that extrinsic sources of
interference(ii) must also be eliminated (along with
intrinsic vitiating factors(i)) from the sphere of
analysis for arriving at correct bio-chemical in-
-dex of drunkenness. Inaccuracy in the determined
index to the extent of even $\pm 1\%$ might tilt the
balance of justice and adversely affect the free-
-dom of individuals in our citizenry.

3. In early 1960 the author was driven in the cir-
-cumstances to think and act on original lines for
finding an answer to the challenge of legal profe-
-ssion (as referred to previously in paragraph 2).
Preliminary experiments, conducted on laboratory
air and reagents, has helped him to arrive at the
conclusion that interfering factors do exist, more
or less, in State medico-legal laboratory and/or in

and/or in the reagents, and that the challenge offered by legal profession was not without foundation. The author was, therefore, faced with the practical problem of how to exclude these extrinsic sources of error(ii) as well as intrinsic interfering factors(i). Without any guidance to follow up(because none of the previous workers has worked on this line to surmount completely the difficulty so presented by extrinsic interfering factors), a tentative scheme was prepared on four cardinal principles: (a) since experiment to determine blood alcohol concentration has to be conducted within the four walls of laboratory premises, let aeration technique be employed to free alcohol from the test sample for absorption in standard dichromate-sulphuric acid mixture to determine its oxidative value iodometrically; (b) let the laboratory air so included and the reagents used for the purpose be jointly subjected to aeration under identical physical conditions prevailing in the case of test blood sample(a); (c) let the quantity of extrinsic factors,

factors, which have had access into the test blood, be similarly absorbed in standard dichromate-sulphuric acid oxidising mixture and their combined oxidative value similarly determined; (d) let the oxidative value for true alcohol content of test sample be calculated from the difference of oxidative values obtained in (a) and (c). Based on these ideal principles an apparatus was designed and constructed by the author in two wings, one of which was used as control wing and the other as test sample wing. The two wings of the apparatus were then connected with a common aspirator to draw in laboratory air through the agency of a Y-glass tube, the two arms of which were connected with the two wings and its tail connected with the aspirator. At the completion of experimental aeration and absorption of alcohol vapour from the test sample along with volatile vitiating factors present in laboratory air and reagents, carried with the air, and oxidative value

oxidative value iodometrically determined, was recorded. Similarly, the oxidative value for extrinsic factors was determined in the same manner. The difference in the two values represented, obviously, the value for true alcohol content of the blood sample under test. Inclusion of laboratory air and exclusion of vicious factors (carried with it) by process of indirect elimination through the agency of the control wing of the apparatus is the unique feature of this original work, which was successfully completed according to plan and the results published in early 1962 i.e. after two years of its start (vide publication Jour. & Proc. Inst. Chem., Vol. XXXIV, Pp. 193-196, July, 1962).

4. The proposition that extrinsic factors do contribute, unduly, to record higher bio-chemical index of alcohol intoxication than corresponds to the correct position is proposed to be now established and embodied in this thesis. The core of this research project lies in the practical preventive measures as have been adopted by the author against all vitiating

mitiating factors-extrinsic(ii)as well as intrinsic

(i)-for getting at accuracy in blood alcohol estimation(vide published work referred to above) and thus in helping administration of justice attain the highest level of perfection.This is the unique feature of the work so contributed.