C H A P T E R IV

(results of experiment on laboratory air)

Measures adopted (and fortified by control test) to prevent error from dual source, intrinsic and extrinsic, have been fully discussed in previous chapters II and III.

In the present chapter is detailed the results of further experimental studies that afforded additional corroborative evidence in support of the fact (thus un-folded in this work) that extrinsic vitiating influen-ces do prevail, more or less, in the atmosphere of medi-co-legal laboratory (the centre of author's activities). For this purpose, standard acid-dichromate, measured out in flask A, blue print figure, page 91-92, was directly connected by its side tube with aspirator pump and sub-jected to aeration experiment at the temperature of boi-ling water-bath for 15 minutes (as was done in the case of experiment on test blood, pages 95-98). The iodometrica-lly determined amount* of dichromate reduced in each case and its calculated alcohol equivalence (1.0 ml of 0.1 N potassium dichromate reduced is equivalent to 1.15 ml of

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* for iodometric determination of amount of dichromate reduced standard sodium thiosulphate, 0.1 N and 0.05 N, was run successively from two microburettes (arranged side by side) that read upto 0.01 ml

of ethyl alcohol) was drawn up in tables. Experiments were arranged in different working sections of the laboratory at different working hours of the day's business with doors and windows open to the outside air. The selected hours were: (i) before commencement of day's work; (ii) at the peak hour of routine ana-lyses; (iii) at the quiescent hour after the day's work was over and the staff members were relaxing in their respective sections. The experimental results were as drawn up in Tables 1-15 that follow:

Blood Alcohol Test Section

(i) before commencement of day's work

Table 1

I Experiment	II Vol. of 0.1 N $K_2Cr_2O_7$ reduced	III Alcohol equiva-lence in mg (figure in col. II multiplied by 1.15)
1	0.002	0.0023
2	0.003	0.0034
3	0.002	0.0023

(ii) at peak hour of routine analyses

Table 2

I Experiment	II Vol. of 0.1 N $K_2Cr_2O_7$ reduced	III Alcohol equivalence in mg (figure in Col. II multiplied by 1.15)
4	0.0030	0.0034
5	0.0040	0.0046
6	0.0030	0.0034

(iii) at the quiescent hour after the day's work was over

Table 3

I Experiment	II Vol. of 0.1 N $K_2Cr_2O_7$ reduced	III Alcohol equivalence in mg (figure in Col. II multiplied by 1.15)
7	0.0030	0.0034
8	0.0020	0.0023
9	0.0020	0.0023

General Analytical Section

(dealing with miscellaneous medico-legal articles, bombs, explosives and other suspected material connected with crime cases)

(i) before commencement of day's work

Table 4

I Experiment	II Vol. of 0.1 N $K_2Cr_2O_7$ reduced	III Alcohol equivalence in mg (fifure in Col.II multiplied by 1.15)
10	0.0020	0.0023
11	0.0030	0.0034
12	0.0020	0.0023

(ii) at peak hour of routine analyses

Table 5

I Experiment	II Vol. of 0.1 N $K_2Cr_2O_7$ reduced	III Alcohol equivalence in mg (figure in Col.II multiplied by 1.15)
13	0.0040	0.0046
14	0.0050	0.0057
15	0.0040	0.0046

(iii) at the quiescent hour after the day's work was over

Table 6

I	II	III
Experiment	Vol. of 0.1 N $K_2Cr_2O_7$ reduced	Alcohol equivalence in mg (figure in Col. II multiplied by 1.15)
16	0.0030	0.0034
17	0.0020	0.0023
18	0.0020	0.0023

Biological Section

(dealing with blood and semen stains, hairs, fibres etc and other miscellaneous articles)

(i) before commencement of day's work

Table 7

I	II	III
Experiment	Vol. of 0.1 N $K_2Cr_2O_7$ reduced	Alcohol equivalence in mg (figure in Col. II multiplied by 1.15)
19	0.0030	0.0034
20	0.0030	0.0034
21	0.0030	0.0034

(ii) at peak hour of routine analyses

Table 8

I	II	III
Experiment	Vol. of 0.1 N $K_2Cr_2O_7$ reduced	Alcohol equivalence in mg (figure in Col. II multiplied by 1.15)
22	0.0040	0.0046
23	0.0050	0.0057
24	0.0040	0.0046

(iii) at the quiescent hour after the day's work was over

Table 9

I	II	III
Experiment	Vol. of 0.1 N $K_2Cr_2O_7$ reduced	Alcohol equivalence in mg (figure in Col. II multiplied by 1.15)
25	0.0030	0.0034
26	0.0040	0.0046
27	0.0030	0.0034

Toxicological Section

(dealing with analysis of viscera and other material connected with suspected poisoning cases)

(i) before commencement of day's work

Table 10

I	II	III
Experiment	Vol. of 0.1 N $K_2Cr_2O_7$ reduced	Alcohol equivalence in mg (figure in Col. II multiplied by 1.15)
28	0.0040	0.0046
29	0.0050	0.0057
30	0.0040	0.0046

(ii) at peak hour of routine analyses

Table 11

I	II	III
Experiment	Vol. of 0.1 N $K_2Cr_2O_7$ reduced	Alcohol equivalence in mg (figure in Col. II multiplied by 1.15)
31	0.0080	0.0092
32	0.0090	0.0103
33	0.0080	0.0092

(iii) at the quiescent hour after the day's work was over

Table 12

I	II	III
Experiment	Vol. of 0.1 N $K_2Cr_2O_7$ reduced	Alcohol equivalence in mg (figure in Col. II multiplied by 1.15)
34	0.0050	0.0057
35	0.0050	0.0057
36	0.0050	0.0057

Excise Section

(dealing with illicit liquor, spirits, tinctures etc, ganja (Cannabis Indica and its products) and other narcotic substances like opium etc)

(i) before commencement of day's work

Table 13

I	II	III
Experiment	Vol. of 0.1 N $K_2Cr_2O_7$ reduced	Alcohol equivalence in mg (figure in Col. II multiplied by 1.15)
37	0.0030	0.0034
38	0.0030	0.0034
39	0.0040	0.0046

(ii) at peak hour of routine analyses

Table 14

I	II	III
Experiment	Vol. of 0.1 N $K_2Cr_2O_7$ reduced	Alcohol equivalence in mg (figure in Col. II multiplied by 1.15)
40	0.0060	0.0069
41	0.0060	0.0069
42	0.0060	0.0069

(iii) at the quiescent hour after the day's work was over

Table 15

I	II	III
Experiment	Vol. of 0.1 N $K_2Cr_2O_7$ reduced	Alcohol equivalence in mg (figure in Col. II multiplied by 1.15)
43	0.0040	0.0046
44	0.0040	0.0046
45	0.0040	0.0046

SUMMARY AND DISCUSSION

Experimental results, drawn up in Tables 1-15, have afforded evidence of probative value: (i) that volatile factors, likely to vitiate blood alcohol test results, do prevail (more or less) in medico-legal laboratory air as potential extrinsic source of error (as indica--ted previously in 'introductien', Chapter I, Sectien I-b, pages 11-22 and established in the assigned prog--ram vide paragraph 4 'synopsis', pages 12(-12)that follows); (ii) that non-inclusion of precautions to screen these factors (i) from the sphere of test precedure obviously involved grave risk of inclusion of an element of posi--tive error* (represented, for example, by correspon--ding figure in col.III of the 45 experiments, drawn up in Tables 1-15). Calculated in terms of percentage of

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* quantum of error(from laboratory air)likely to be in--cluded in results, is a function(f) of several determi--native factors as previously noted in mathematical expressions(x,y), pages 49-50.

Climatic conditions of a place (where such laborate--ries are located) might also determine the degree of concentration of volatile substances in laboratory air: rapid decomposition of viscera and other biologi--cal material(received at the laboratory for analysis) is a natural event occuring in tropical countries with humid atmosphere(like India)and therefore, laboratory atmosphere is likely to be charged more with volatile substances than of those situated in cooler countries with drier atmosphere.

percentage of blood alcohol, this error (representing fallacious alcohol index) would assume, obviously, a proportionately high figure to tilt the balance of justice unduly. Drastic measures adopted in author's work (vide 'Summary And Discussion', Chapter III, pages 97-100) have thus prevented error from this source (and other sources). The work has thus plugged the palpable lacuna (hitherto ignored or under-estimated).

QUANTITATIVE AGREEMENT

QUANTITATIVE AGREEMENT AMONGST THEORY, PRACTICE AND RESULTS

In unfolding the secret of duality of the complex problem of prevention of error from the dual source, extrinsic and intrinsic, and finding a solution to it, the work (embodied in the thesis) has furnished evidence of: (i) having brought new facts to light, (ii) having broken the prevailing blood alcohol-error vicious relation, (iii) having prevented error from the dual source and (iv) having established a new order of relationship amongst facts, and between facts and experimental results. The highlights of achievement in this program were:

I that an element of error (represented by [Ve] vide expressions (1,2,3), pages 36-39) from extrinsic sources (laboratory air and reagents), hitherto undefined or ill-defined and unexplored, was detected and brought to light (vide 'critical survey', Section I-c, 'introduction', Chapter I, pages 22-29; vide 'review of previous methods', pages 35-40; vide 'balance sheet', pages 41-42),

II that (in support of author's statement I) the quantum of error [Ve] was measureable in practice and

and measured also in terms of equivalence of standard dichromate reduced (vide experimental results drawn up in Table 2, Chapter III, page 96 and Tables 1 to 15, Chapter IV, pages 103-110),

III that (in support of statements I, II) the unmitigated quantitative alcohol-error [Ve] vicious relation (that has gone unnoticed or noticed but ignored and therefore encouraged inclusion of an element of positive error as a permanent feature in test results of previous methods) was broken, error from extrinsic sources prevented (vide 'summary', processes (ii-a,b), pages 98-99) and the author's major assignment in the program thus achieved as scientific reality. This was the unique achievement that has thus served also as the key-weapon in meeting challenge or criticism from any quarter (referred to in Section I-d, 'introduction', Chapter I, pages 29-32),

IV that the error (represented by Vi) from intrinsic normal volatile metabolites (ketone bodies etc normally present in test blood) was prevented by fixing these vitiating factors in Scott-Wilson reagent that retained them (vide 'procedure', page 92 and process(i), 'summary', page 98),

V. that the error(vide III,IV above) from the dual source, extrinsic (III) and intrinsic (IV), was thus prevented, a new order of error-free blood-true alcohol relationship established as scientific reality and accuracy in test results at 100 percent ± 0.4 accurate (vide 'results of recovery', Table 1, page 96) attained at the highest level of security against mis-carriage of justice on the point of bio-chemical index of drunkenness (i.e. blood alcohol concentration), thus determined without a parallel to cite,

A N D

VI that (vide III,IV,V) a unique bond of law-science relationship was built up and a new avenue thus opened up for enlarging one's vision in the matter of detection of the guilty (of drunkenness) and protection of the innocent with precision of judgement, exercised at the highest level of perfection.