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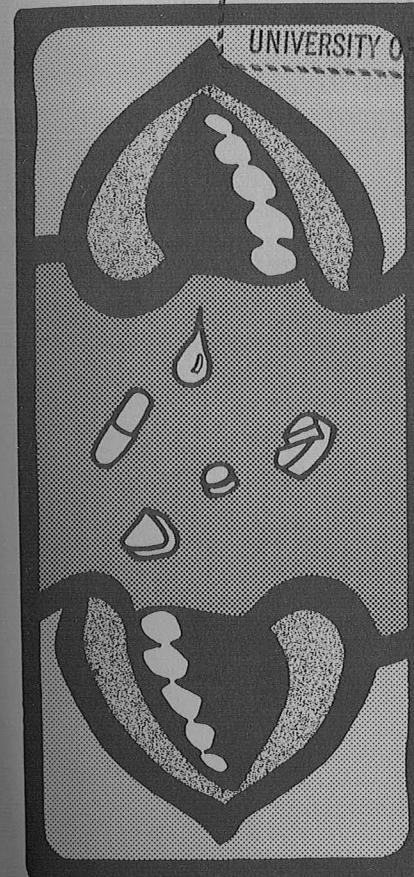
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**PACIFIC
INFORMAT-
ION
SERVICE
ON
STREET-
DRUGS**

j.k. brown

m.h. malone

: editors

VOL. THREE NO. 2

THE CHEMICAL COMPOSITION OF ILLICIT DRUGS

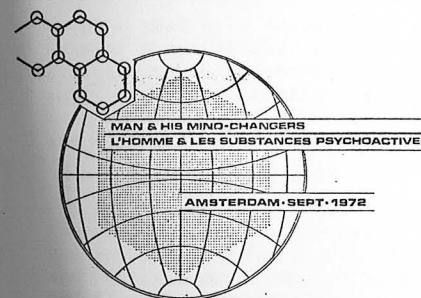
IN MUNICH

Dr. D. J. Mattke
Verein für Drogenhilfe e. v.
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and

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30. INTERNATIONAL CONGRESS
ON ALCOHOLISM & DRUG DEPENDENCE
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30^e CONGRÈS INTERNATIONAL SUR
L'ALCOOLISME & LES TOXICOMANIES
4-9 SEPTEMBRE 1972

This paper was presented
Wednesday - September 6, 1972.
Section B-3, "Analysis of
Controlled Substances."

This completes the publication
of the papers presented in
Amsterdam [Pacif. Inform. Serv.
Street-Drugs, 2(5-6): 31-48 (1973)]
The data and conclusions presented
here are important historically
and have significant sociologic
and toxicologic aspects. Also,
the availability of these data
increase the factual knowledge
concerning the actual composition
of illicit drugs.

The Editors

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INTRODUCTION

A specific aspect of the "drug problem" is the lack of knowledge concerning the chemical composition of drugs available on the "black market". Neither dealer nor user have verified information in this respect. As a rule investigators concerned with the various aspects of drug misuse (physicians, scientists, journalists, and judges) do not have this information either. Therefore, there are considerable difficulties arising in therapeutic and social work as well as in scientific discussions of the drug problem.

To our knowledge only a few reports exist concerning the chemical composition of widely sold illicit drugs. A Canadian investigation (Marshman and Gibbins, 1970) found among 176 street samples offered as LSD only 97 (56.2%) contained relatively pure LSD. Fifty-eight samples offered as mescaline - not one contained the alleged drug. A group from Holland (Fleddt Kok *et al.*, 1971) analyzed the Amsterdam market and found similar results for LSD and mescaline, respectively. Among the 119 street samples from the Amsterdam market, three samples sold as "hallucinogenics" contained highly toxic material with no psychoactive substances found.

METHODOLOGY

a.) Origin and Composition of the Analyzed Samples

We focused our investigation on the illicit "trip" market in Munich from December 1970 to November 1971. Analyzed during this time were all the street samples received at the Municipal Drug Center. In the course of the investigation, only those hashish preparations were accepted for analysis that were said to contain admixtures of opium, belladonna, or strychnine. Likewise, but just occasionally, morphine, heroin, opium preparations, and other opiates, were analyzed to get a gross orientation of the market. The same applied to alleged samples of amphetamine ("speed"). This part of the investigation included 78 samples that were declared to be "trips", "speed", opiate and/or hashish preparations. Furthermore, we checked 66 samples that were sent directly to the Deutsches Arzneiprüfung-Institut (DAPI) from pharmacists, physicians, and undesignated private persons. Nearly all of the samples were specified to originate from the "market" in Munich and vicinity, and were generally identified as "drugs".

b.) Chemical Analysis

The details of procedures and techniques used for chemical analysis have been reported elsewhere (3-5). Thin-layer chromatography, infra-red and ultra-violet spectrophotometry were used for identification and purity assessment, while gas-chromatographic, spectrophotometric and fluorometric methods were employed for quantitative analysis. To determine very small amounts of LSD, gas-chromatography and fluorometry were used.

In spite of many years of specific experience in pharmaceutical analysis, a reasonably exact determination of the chemical composition of a number of samples was only attained by combining different analytical procedures.

C.) Documentation

Most of the individual samples were photographed on color film before analysis in order to compare preparations received later with those already received. In addition to the results of the analysis and methods used, other characteristics of the sample such as shape, color, weight, and size were recorded.

FINDINGS

The analytical results of 144 street samples, whose origin has been described, are summarized in Table I. LSD "trips" and other samples designated as "trips" (mescaline and psilocybin) amounted to the bulk of the investigated material (109 samples). Eighty-nine samples were alleged to be LSD, 58 of these samples contained pure LSD only. Nineteen specimens, especially "paper trips" and other preparations of large surface (sugar cubes, dextrose tablets, powder capsules, and solutions), were often decomposed or contaminated. Twelve samples, with one exception, contained inert materials or harmless compounds (saccharine, dextrose, lactose, urea, potassium sulphate etc.). The one exception was a liquid that was claimed to be pure LSD, but consisted of 60 % sulphuric acid. Further spreading in the market of this solution was prevented. Among the 14 samples declared to be mescaline, only one sample contained mescaline (capsule filled with 0.29 gm of pure mescaline hydrochloride).

None of the six alleged psilocybin samples was found to contain the drug. The chemical analysis of the mescaline and psilocybin declared samples yielded LSD in two instances, and inert ingredients such as colored lactose, starch, dextrose, talcum powder, dusting powder, etc., in all the other samples.

The hashish samples that were claimed to be contaminated with opium, strychnine or belladonna contained none of these substances. The samples were found to be particularly rich in tetrahydrocannabinol, the principal psychoactive ingredient of hashish.

White and grayish-white powder substances were frequently claimed by drug users to be heroin. One sample was heavily decomposed heroin which could have originated from old stocks. The remaining samples contained lactose, starch, penicillin-G sodium (two instances), and sodium cyanide (one sample).

Among the opium preparations, crude opium and opium extract was each found twice, the latter with a morphine content of about 20 % and once an acetic opium tincture ("Berlin Tincture", "H-Tincture"). Three samples were alleged to be morphine - two of these contained relatively pure morphine hydrochloride, the third sample contained no morphine but was a pulverized analgesic tablet.

The amphetamine ("speed") samples consisted of five tablets, two ampoules and five capsules - seven contained amphetamine only, one ampoule contained amphetamine plus oxycodone, two were amphetamine with LSD. Two alleged amphetamine samples were determined to be metoclopramide (Paspertin^R) for one and the other was the anti-depressant amitriptyline.

The results of the quantitative analysis of the LSD samples studied

are listed in Table II. The dose range was found to vary between 12 and 244 mcg. of LSD (calculated as base). Samples with LSD concentrations below 50 mcg. were predominately the contaminated specimens, such as "paper trips" and similar preparations. The higher dose samples were mostly of great purity, and with few exceptions, they were small, white or colored, well manufactured tablets. The declared dosages often were highly accurate.

Table I - Results of Qualitative Analysis of 144 Street Samples

Alleged Chemistry	Pure	Impure	Other Drug or Inactive Material	Number of Samples
LSD	58	19	12	89
Mescaline	1	-	13	14
Psilocybin	-	-	6	6
Amphetamine	7	3	2	12
Heroin	-	1	6	7
Opium	5	-	-	5
Morphine	2	-	1	3
Hashish with Admixtures	7	-	1	8
Totals	80	23	41	144

Table II - Quantitative Analysis of 77 LSD-Containing Street Drugs

LSD Content (mcg.)	Number of Samples	Percentage
0 - 50	18	24.7
51 -150	37	45.2
151 +	22	30.1

DISCUSSION

According to "textbook" psychiatry, the main factors causing the development of drug dependence, are thought to be found in individual personality characteristics, in the specific drug taken, and social environment. Extensive literature exists about personality characteristics and structure of drug dependent persons (8). The social conditions contingent with a high incidence of drug dependence have been discussed in recent reports (10,14-15). Additionally, reports concerning the pharmacology (12-13,16) and epidemiology (11,16-17) of the

presently most widely abused drugs are published more and more frequently. Yet, what is almost never considered is that the majority of the listed drugs are illicit, and that their specifications are of misleading accuracy and may lead to incorrect and dangerous consequences. For practical work with drugs (emergency cases such as "bummer trips", overdoses, negative reactions), as well as long-range social, therapeutic and forensic considerations, accurate information about the chemical composition of illicit drugs is essential.

The purpose of this study was to investigate the illicit "trip" market in Munich during the time period between December 1970 and November 1971. It is not feasible to compare the corresponding studies of Marshman and Gibbins in Toronto (1) or Filedt Kok *et al.*, in Amsterdam (2) in detail. Methodological and criminological difficulties in gathering illegal street samples lead to great differences in the composition of investigational materials. Nevertheless, there were certain similarities among the markets in Toronto, Amsterdam and Munich.

1. As a rule street samples sold as psilocybin or mescaline were adulterations. In the Munich study most samples analyzed were inert compounds such as colored lactose, starch, dextrose, talcum, and dusting powder.
2. Of investigational samples gathered, the inactive, inert compounds accounted for 30 % in Munich, 35 % in Toronto and 40 % in Amsterdam.
3. Claims of admixtures of strychnine or amphetamine to LSD were neither in this study nor the one in Toronto found to have validity.
4. Neither in Amsterdam, from November 1970 until April 1971, nor in Munich from December 1970 until November 1971 was there any evidence that the often speculated heroin market existed in these areas.
5. The Amsterdam investigational group had to intervene three times in the sale of highly toxic substances. The most severe cases in Munich were sales of sodium cyanide as heroin and 60 % sulphuric acid as a solution of LSD.

Aside from practical and clinical aspects, all of these results are highly relevant for the interpretation of the epidemiological data, which is constantly compiled from numerous inquiries in schools and universities. So far, most of the existing data about the composition of illicit drugs are informative in regard to drug-users' attitudes. However, the actual pattern of the use of chemically active substances remains an unknown factor.

A further discrepancy between widely spread views concerning the illicit drug market and our results, were the hashish preparations. The argument of intentional contamination of hashish with active admixtures such as opium, which has played an essential role in the struggle against drug misuse, does not hold true for the Munich market. Some samples were found among Amsterdam's investigational material where hashish was found to be contaminated with raw opium. In any case, further testing of samples of hashish from the markets of European metropolitan areas for the presence of opium would be highly advisable.

The 77 samples identified as LSD were also quantitatively analyzed for their LSD content. The concentrations of LSD in most samples varied from 50 to 150 mcg. The highest dose found was 244 mcg. of LSD

(calculated as base and equals 293 mcg. of LSD tartrate). Most of the samples in tablet form contained extremely exact doses, mostly 100 and 150 mcg. and occasionally 200 mcg. of LSD per tablet. During the time of this investigation some similar LSD preparations were widely available in Munich. In such cases, a few specimens of one series were examined and compared for LSD content. There was very little discrepancy in dosage of these widespread forms with a variation of not more than 2 % of the LSD content. These results indicate the galenic skills of the underground chemists.

LSD concentrations up to 250 mcg. ("psycholytic" dose range) are used in psychoanalytic oriented psychotherapy (9). The most frequent forms of psychic reactions that occur within this dose range can be managed in a controlled therapeutic situation. (For doses of more than 250 mcg. the term psychedelic is used.)

As we have pointed out, samples of LSD and hashish believed to contain psychoactive extraneous materials could not be documented to have such. Even more unreliable were the claims of the amount of LSD per sample. As a rule, much greater doses (up to 600 mcg.) were claimed. Frequently, "bummers" that were brought to the drug centers as emergency cases were explained in the terms of exaggerated LSD concentrations, or the fear of an admixture with strychnine or "speed". Also, the widespread opinion that negative drug experiences such as "bummers" are triggered by deteriorated LSD cannot be held true. Considering the minute amounts of active ingredients in LSD samples, deterioration products occur in amounts insufficient to be considered psychoactive. Experienced drug users, as well as drug counselors and other experts, tend to explain negative drug experiences chemically. This indicates a deficit of information in relationship to many aspects of illegal drug use on the one hand, and on the other a rejection of adjacent causes which can be found in the personality characteristics and the social environment of the user.

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