information should be sought without delay so that the value of introducing these tests can be assessed.

A major uncertainty in deciding on any policy change is the lack of long-term prospective studies of the outcome of non-A, non-B hepatitis. The progression from mild acute disease to chronic active hepatitis and the long persistence of abnormal serum-transaminase results have both been documented,[14,17] but there are as yet no reports of 10-year or even 5-year follow-up studies on patients in whom asymptomatic non-A, non-B hepatitis developed after transfusion. Our results suggest that the findings of such studies are unlikely to be as sinister as the first accounts suggested.

At present the commercial RIA tests for detecting anti-HBc are more expensive than those for HBsAg; the method is also more time-consuming, and some samples give equivocal results. The availability of substantial amounts of HBcAg made in *Escherichia coli* by means of genetic-engineering techniques[18] should now permit the development of a fourth generation of methods better adapted to the current needs in the transfusion service.

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Public Health

THE RISING PRICE OF MUSHROOMS

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HARD on the heels of reports on the rapid rise in heroin addiction,[1] the increasing drugs problem,[2] and continuing solvent inhalation[3,4] in Glasgow there has been an unprecedented epidemic of the abuse of indigenous hallucinogenic fungi. In September and October, 1981, 49 teenagers and young adults (44 males, 5 females; age range 12 to 28 years, mean age 17·5 years) presented to the accident-and-emergency department of four Glasgow teaching hospitals after deliberate ingestion of varying quantities of raw, freshly picked *Psilocybe semilanceata* (liberty cap), known colloquially as "magic mushrooms". 41 (83·7%) had evidence of sympathomimetic stimulation including mydriasis and tachycardia, while 47 (95·9%) had experienced or were experiencing euphoria and/or visual hallucinations. 4 patients had also ingested alcohol, but no other intoxicants had been taken. There was incomplete documentation of previous drug or alcohol abuse, but none had eaten "magic mushrooms" before, and none admitted to practising solvent inhalation. Gastric lavage was carried out in 39 (79·6%) patients. 35 (71·4%) of the 49 were admitted for observation, and all of these made a rapid and uneventful recovery without further therapy. Of the remainder, 13 were discharged after assessment and 1 refused to be admitted. At one of the hospitals 14 patients attended during September and October for the effects of "mushroom" abuse, compared with 6 for manifestations of the abuse of other hallucinogenic agents or narcotics (2 cannabis, 2 toluene-containing compounds, 1 lysergic acid diethylamide, 1 heroin). The figures for the latter group of substances are representative for any two-month period in 1981.

Ps. semilanceata is a gill fungus, commonly found growing in troops among grass in parklands, gardens, fields, and heaths in Britain, particularly in western regions. It has a sharply pointed pale-yellow cap 8 to 14 mm wide and up to 18 mm tall, supported by a tall cream-coloured wavy stem.[5,6] Its gills are purple/black with a white edge. A few hours after picking, the base of the fungus turns greenish-blue, especially the part which was below ground. This is due to an oxidation reaction[7] which is characteristic of *Psilocybe* genus. Liberty caps appear in autumn (mainly September to November), and cropping is heavy when the season is wet. The fruiting-bodies contain indoles, 4 phosphoryloxy-N, N-dimethyl-tryptamine (psilocybin) and the demethylated equivalents of this (baeocystin and norbaeocystin), as well as the more unstable psilocin.[8] All these are psychoactive compounds of varying potency and are found in varying quantities within the fungus. Psilocin is also produced by the hydrolysis of psilocybin after ingestion, and it is the more potent hallucinogenic agent.[9] The effect of these substances on brain biochemistry is very complex and ill understood.[8] They are thought to act by altering the concentrations of indoles, including serotonin, in the central nervous system, and thus interfering with the transmission of stimuli regulating the

processing of information and perception. The liberty cap contains 0·1–0·4% psilocybin by weight of dried fungus and up to 0·2% psilocin.[9] Hence 20 to 30 g of freshly picked or 5 g dried "mushrooms" (approximately 30 fruits) contain 3 to 12 mg psilocybin.[9] 3 to 6 mg would be expected to produce hallucinations in man[9]—and this effect is potentiated by alcohol.

Cases of accidental and intentional poisoning from plants including fungi have been rare in Britain.[10] Since Cooke[11] remarked that *Ps. semilanceata* had never been used in Europe "even as a casual inebriant", only a handful of cases of hallucinogenic-mushroom poisoning has been reported.[7,12–14] A group in Dundee has reported the clinical manifestations of intoxication from "magic mushrooms" in 27 cases collected during the autumns of 1979 and 1980.[15] They also commented on the increase in *Psilocybe* mushroom abuse on Tayside. In parts of Britain where hippy culture is prevalent large meetings to gather these fungi ("sillys") for hallucinogenic purposes have been documented.[16-18] There has, however, been an absence of publications reporting any sequelae of "mushroom" ingestion from the neighbouring hospitals. Do few people seek medical attention in these areas, or are minor forms of poisoning not considered noteworthy? We consider all forms of hallucinogenic abuse to be of great importance. A nationwide upsurge in "mushroom" abuse would have important implications in terms of cost and workload for the health and social services, and information about this problem from medical practitioners and other professional groups elsewhere in the country would be of considerable interest. Some might feel these considerations unimportant compared with the economic and health costs incurred by alcohol and tobacco abuse, but since these mushrooms can be harvested throughout the year with the aid of growing-kits[19] it is foreseeable that a constant problem will arise. In addition, inexpensive manuals describing the properties and use of hallucinogenic mushrooms, including the *Psilocybe* fungus, are readily available.[9,20,21] There is a potential danger in ingesting any mushroom or toadstool growing in the wild, since much more poisonous fungi[22] can be mistaken for edible specimens and liberty caps.[22] The more mature the liberty cap, the more distinctive its profile. Of the Glasgow patients, those who were specifically asked about the possibility of misidentification of the fungus said they were confident in picking the correct variety because of its colour and "pimple" or "nipple", which refers to the umbo on the cap.[23] Search of the literature produced only two reports, both from the United States, of deaths reputed to be the consequence of poisoning from the genus *Psilocybe*,[21,24] but the species in both cases was *Ps. baeocystis*. A lethal dose for *Ps. semilanceata* has been estimated.[9] Tolerance due to the psychoactive compounds in "magic mushrooms" is known to occur, and although they have been considered non-addictive, long-term use is harmful.[11] Premature mental and physical ageing has been noted in Mexico, where professional divinators use *Psilocybe* species regularly.[11] It is important that medical practitioners are aware of this form of poisoning, for it is likely to become an increasingly common form of intoxication. It must be considered in the differential diagnosis of acute toxic or schizophrenic-like states as well as in youngsters presenting with sympathomimetic signs. Peden and his colleagues[15] suggest that the presence of the typical clinical features associated with a good description of the fungi ingested would preclude gastric lavage or induced emesis in patient management. However, the safest policy appears to be active, with stomach emptying followed by a decision on whether to admit the patient, depending on the presence or absence of clinical features of poisoning relevant to the time of ingestion. In our experience the effects of poisoning have resolved within 6–12 h, but more severe and delayed effects can occur.[7,12,15]

The reason for the upsurge in "magic mushroom" abuse in our area is obscure. The youngsters' knowledge of the effects of the eaten fungus and its availability has increased, but this cannot be attributed to press coverage. Local publicity against solvent abuse,[3,25] legal restriction on the sale of solvents, the excellent police and social-work activities related to the problem, and the follow-up reports on complications of "sniffing" these chemicals[4,26] might be reasons for the search for alternative hallucinogens in a depressed area with rising unemployment and consequently more free time. The fungi are freely available to all ages, and their picking and possession (unless cooked or processed) do not contravene the criminal law.[27,28]

Since "mushrooms" have made a significant contribution to hallucinogenic substances currently available, active measures should be implemented to stem the tide of abuse. Glasgow's experience is not unique, and so there should be concern throughout the country. Obviously there are several difficulties in controlling their use, especially since the fungi are widely distributed. In addition, any inquiry into the problem runs the risk of attracting publicity, which may encourage popularity. Several avenues of attack are possible. Firstly, legislation can play a part, although it cannot be a totally effective deterrent. At present the hallucinogenic ingredients of "magic mushrooms" are proscribed substances under the Misuse of Drugs Act 1971, but the possession and growing of the fungi are not. There is a precedent for amending the law so that possession of a particular mushroom fruit or its parts from which psychoactive chemicals can be obtained would become illegal. After the successful appeal in R *v* Goodchild[29] the Criminal Law Act 1977 redefined cannabis for the purposes of the 1971 Act. Whereas previously "the flowering or fruiting tops of the plant" were "the words of limitation",[29] the definition was amended to include all parts of the cannabis plant from which active material could be obtained. The hallucinogenic mushroom/toadstool could therefore be defined in similar terms and its possession designated illicit. A legal curtailment on harvesting-kits would also be necessary, as well as some control over the sale of booklets for potential users. Although total eradication of this widespread indigenous fungus is clearly impossible, its growth in easily accessible areas could be controlled with fungicidal sprays. These methods could be combined with a multidisciplinary education programme aimed at the young, who are particularly vulnerable by their immaturity and peer group pressures.

On medical grounds "mushroom" abuse is undesirable. However, society has to make the final judgement on the acceptability of the current practice. We should recommend urgent attention to the problem. In her poem 'Mushrooms', Sylvia Plath's words may well be prophetic and pertinent to our anxieties:

"Our kind multiplies:
We shall by morning
Inherit the earth.
Our foot's in the door".[30]

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References on next page

Disabilities and How to Live with Them

ULCERATIVE COLITIS

I REMEMBER well, as a 15-year-old high school student, the day I first passed blood in my stool. I told my parents and they sent me immediately to our family doctor. He made his diagnosis easily: "Young man, you have got some haemorrhoids". He gave me a prescription for suppositories and off I went. About two weeks later the blood loss became greater and I consulted the doctor again. The man remained firm in his original opinion, but sent me to a specialist. There I met the rectoscope for the first time. I felt hopeless, helpless, and awful. The posture required for this examination is not only embarrassing but is also difficult to maintain for a long time. To undergo rectoscopy is very tiresome—I have had over forty—because you have to starve for a day or more and it may be necessary to have a laxative enema as well. The sigmoidoscopy takes about an hour and it is normally difficult to pass the whole instrument, and many biopsy specimens have to be taken. I think that the examining doctors are often unaware of how it really feels to undergo all this, especially when an illness is in an acute phase. A doctor who has had such an examination himself may understand the patient better and carry out the examination more sympathetically. I think that doctors and/or students should undergo a number of similar unpleasant procedures during training.

At the time of my first sigmoidoscopy I was told that I had proctitis—an inflamed rectum—and only learned two years later that in fact I had ulcerative colitis. I was given sulphasalazine tablets and suppositories, and was put on a strict diet: no fats, oils, fatty meat or fish, wholemeal products, nuts, currants, raw food, cabbage, onion, milk, alcoholic drinks, spices, tobacco, and much besides. These limitations are not inconsiderable, but when it is for the good of your health you can bear it more easily. However, I did not expect any improvement. It is usual for doctors to suggest that a light, low-fat diet is necessary. Sometimes, however, a spastic colon and a hard stool, which can cause intestinal damage, may result. Wholemeal products are as necessary for colitis sufferers as they are for healthy people. I have even heard about a colitis patient who was free from symptoms during the war, in the winter of 1944–45, when predominantly turnips and bulbs were eaten.

Most colitis patients know when and which foods and drinks disagree with them. In my own case chocolate, alcoholic drinks, and spices are the main culprits.

After two years of chronic colitis I had an acute exacerbation and at last was admitted to hospital for observation. They examined me inside out. I had laxative enemas, rectoscopies, X-rays, blood tests, tests of nutritional status, and gastric acid tests—everything you can imagine!

Owing to the poor resorptive capacity of my large intestine I was given vitamins and ferrous fumarate. I was now told that I had ulcerative colitis—60 cm of inflamed, reddish mucosa. I was treated with corticosteroid tablets and enemas. In a few weeks the disease was in good remission. I was surprised, therefore, a few months later when I again started to pass much bloody mucus. The medical staff had failed to tell me that I was suffering from a chronic disease with acute exacerbations. For the past 10 years my treatment has varied. During acute phases, when there was much blood loss, I was given prednisone and high dose sulphasalazine. During quiet, chronic stages I was given a maintenance dose of sulphasalazine. Some doctors now think that it does not matter whether low dose treatment is given or not. They think that an exacerbation can occur at any time; only its severity can be diminished.

Sulphasalazine can cause an allergic reaction and also haemolysis when taken chronically. The side-effects of long term prednisone are well known, but, besides these, prednisone enemas often cause embarrassing borborygmi and flatulence. Recently I discovered that these symptoms are partly caused by the diuretic added to the enema. The enema also increases the amount of mucus secretion and is therefore actually causing inflammation.

Self-administration of an enema, avoiding air bubbles, is difficult, especially for young people in awkward situations such as while on holiday or with friends. Suppositories, on the other hand, are small and convenient, there is no need to bring them to body heat before use, and, unlike enemas, there is no difficulty with overnight retention.

It strikes me that, during the past fifteen years, there has been no appreciable change in treatment—prednisone and suphasalazine are still given for acute colitis.

During an acute phase of colitis, when the urge to defaecate can be great, sphincter control is almost absent. It is better, therefore, not to wear white trousers in summer. A man who met with such an accident while shopping, asked a passer-by

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