

EDITORIAL : VAN DIE REDAKSIE

CYCLAMATES

There is now incontrovertible proof to the effect that rats should not use cyclamates, certainly not in large doses. Rats fed on cyclamates in doses of 2,500 mg./kg./day often develop cancer of the bladder, and this finding has led to the banning of the free use of cyclamates in a number of countries. Fortunately or unfortunately, depending on the viewpoint one takes, there is very little other reliable evidence of the toxicity of cyclamates, although various experiments have suggested certain other side-effects. In a statement issued by the American Health, Education and Welfare Department, Dr J. L. Steinfeld, the Deputy Assistant Secretary, saw fit to ignore all the other proffered evidence of the dangers of cyclamate sweeteners, and, as most of the research was done in America, one must assume that the authorities there are not convinced that side-effects other than the bladder cancers of rats have been acceptably proved.

At a press conference on cyclamates held on 18 October Dr Steinfeld said: 'There is absolutely no evidence to demonstrate in any way that the use of cyclamates has caused cancer in man. There is no evidence that the use of cyclamates has caused malformation in children or any other abnormality in humans, other than a rare skin hypersensitivity.'¹ The question that not unreasonably comes to mind is: Then why ban them? The whole cyclamate controversy highlights a very important problem in modern medicine, namely, how far must we trust our own research and be led by the results? Must we accept every bit of evidence of toxicity, however far-fetched, or may we use our common sense and reject certain findings of the laboratory as invalid?

Let us look at the available evidence. Rats were fed cyclamates at doses of 2,500 mg./kg./day for their entire lives and they were then sacrificed at various stages to ascertain whether any deleterious effects could be found. One cyclamate tablet, such as is used to sweeten tea or coffee, contains about 40 mg. of sodium cyclamate, therefore it follows that the equivalent dose for a man would be about 5,000 tablets per day. Such dosage is patently absurd. If one regards sugar as being 30 times less sweet than cyclamates, one can imagine what amounts of sugar would have to be consumed to reach the equivalent sweetening effect, for that is one fact that is at the moment often forgotten. Most people use sugar or cyclamates for no other reason than to sweeten their food and thus to make it more palatable. They do not regard sugar as a food and as a source of calories, unless they consciously wish to avoid the intake of additional calories. Sugar is not a natural food, it is a sweetener, and it is as a sweetener that it is used by the vast majority of people.

The mere fact that rats had to be sacrificed at various stages in order to be examined is one of the most significant proofs of the low toxicity of cyclamates. To have survived such incredible doses the rats must have been of a very hardy strain indeed, or sodium cyclamate must be a remarkably safe preparation. The equivalent dose of sugar would have killed off the experimental animals before any research could have been done. And that

brings us to the crux of the matter: when is research valid?

Boyd *et al.*² published an article in 1965, reporting their findings after feeding rats on large doses of sucrose. The doses ranged from 5 to 80 G/kg. Not unexpectedly, the rats died at varying periods after receiving the sucrose and the authors reported on the 'toxicity' of sucrose. On reading the article we were irresistibly reminded of the man who broke off the legs of a performing flea, and because the flea would then no longer jump on command, concluded that the hearing apparatus of a flea must be situated in its legs. Rather belatedly Boyd *et al.* try to excuse their fantastic dosages (the equivalent of about 0.5-7 kg. for a man) with the explanation that in order to find the 'target organ' it is necessary to employ such amounts of any preparation tested. Surely logic dictates that after it has been found that a substance is toxic at reasonable dosage levels, higher dosages may be used in order to find the various target organs.

It is difficult to imagine any preparation in use today, either as a foodstuff or as a medicine, which, if given in dosages such as have been employed by the sweetener researchers, would not cause serious illness. What would happen, for instance, if we decided to test the safety of table salt by giving it in doses of 2,500 mg./kg.? We would have to conclude that it is a highly toxic substance and we would have to take it off the market.

It is good and necessary that we be careful and that we keep a watchful brief on all preparations consumed by humans, for only by taking such care can we hope to avoid another thalidomide disaster; but at the same time we must not lose our sense of proportion and allow our guilt-ridden consciences after the thalidomide tragedy to override our common sense. To ban a preparation merely on the grounds of animal experiments with totally absurd dosages, thereby depriving millions of people of free access to a substitute for sugar, does not seem to us to be a reasonable decision. We would like to make an earnest and urgent appeal to all parties involved to retain an objective attitude and not to allow personal bias and financial interests to destroy the high esteem in which we have learnt to hold our modern methods of research.

Both sides have been guilty of using inadmissible methods in order to bring about the acceptance or the rejection of cyclamates as sweeteners. Some of the statements that have been issued are naïve to an extent that one wonders how anybody could expect that scientists would be taken in by them; and yet it seems as if such statements are accepted by high authority. Have we reached the lamentable stage where industry can dictate the results of scientific research? If that be so, we may as well revert to the empirical medicine of the Middle Ages and use the money now spent on medical research to build spacecraft. It seems as if we have become too clever for our own good, and we are no longer able to assimilate the results of our own experiments. We do highly sophisticated research to find the most abstruse facts, and very often we do not know what to do with the results; therefore, we simply forget about them and allow some

future worker to redo the research. Or, as is now the case, we attach values to results that are completely out of proportion to their true validity. Perhaps we have forgotten how to say: 'So what?'

Unless we teach ourselves now to be objective and to evaluate our findings in a sensible and integrated way, we are soon going to become a neurotic people, too scared to eat or drink anything which has not been sterilized, vitaminized, detoxified and generally rendered completely tasteless and dull. We will not be able to use our medicines for fear of causing cancer or of earning for ourselves the wrath of some future, misformed generation.

Let us take a long, sober look at the cyclamate problem. We know that an adult man should not sweeten his food with 5,000 cyclamate tablets per day for fear of developing

cancer. And we also know that if a man takes about 6 kg. sugar per day, he will die. The correct observation we now wish to advocate is: 'Jolly good; and so he should, the glutton.'

Let us sweeten our tea with cyclamates until such time as we can find proof that, at the dosage level employed by the average user, it can cause cancer or any other serious side-effect. If, until such evidence is forthcoming, we run the risk of poisoning a number of people, we are also saving millions of diabetics from a miserable unsweetened life. Above all, let us not lose our sense of perspective and let us forget about vested interests when we judge the results of our research.

1. Steinfeld, J. L. (1969): Statement at Press Conference, 18 October.
2. Boyd, E. M., Godi, I. and Abel, M. (1965): *Toxicol. Appl. Pharmacol.*, 7, 609.

MEDIËSE LITERATUUR

Geneeskunde is een van die min beroepe wat oor 'n uitstekende diens beskik wat die naslaan van reeds verskene artikels betref. Deur middel van *Index Medicus* is dit moontlik om werklik betroubare insig te verkry in die werk wat dwarsdeur die wêreld reeds oor enige mediese onderwerp gepubliseer is. Die regsprofessie het weliswaar ook hul boeke oor besliste sake, maar daar bestaan nie die totaal betroubare indeks van alle artikels soos dié waaroor ons in die geneeskunde beskik nie. Daarom is dit so betreurenswaardig dat navorsers nie altyd korrekte gebruik van die aangebode fasiliteite maak nie.

Diegene wat gebruik maak van *Index Medicus* (of wat daar gebruik van behoort te maak) kan gesien word as twee uiterste groepe met alle skakerings tussenin: Aan die een einde staan die navorsers wat die lyste van gepubliseerde werke grootliks ignoreer. Hulle regverdig hul houding met frases soos: 'Dit is 'n welbekende feit'. Aan die ander uiterste vind ons diegene wat soos 'n stofsuiër deur die literatuur wei en alles opsuig sonder enige poging tot vertering of logiese oordeel. Tussen die twee groepe staan die werkers wat op redelike wyse probeer om gebruik te maak van die gepubliseerde materiaal, sonder om daar die slawe van te word.

Die eersgenoemde groep, naamlik die ignoreerders, is nie baie gevaarlik nie, behalwe vir die heeltemal nie-kritiese leser. Meestal is hul oppervlakkigheid of onrypheid van gedagte so duidelik dat dit eintlik pynlik is. Wanneer mens wel ietwat versigtig moet wees dat daar nie skade gedoen word nie, is wanneer iemand met 'n goeie wetenskaplike reputasie feite as welbekend begin suggereer en sodoende 'n valse milieu skep waarin wanbegrippe dan kan gedy. As mens 'n ding met genoeg outoriteit sê is daar altyd 'n aantal mense wat jou sal glo. Oor die algemeen is die resultaat van die onwilligheid om die wêreld literatuur te raadpleeg egter slegs 'n onnodige en tydsverkwistende herhaling van reeds gedane werk.

Die stofsuiër groep is veel meer gevaarlik. Van der Sandt de Villiers wys tereg daarop dat dit altyd moontlik is om oor enige aspek van die geneeskunde voldoende artikels vir en teen te vind om 'n saak vanuit beide kante te kan beveg.¹ Hierdie literatuur-vrate kan in twee verdere ondergroepe verdeel word: aan die een kant is daar diegene wat voel dat as hulle net genoeg artikels kan aanhaal wat 'n gegewe standpunt inneem, dan moet die standpunt waar wees. Hulle is lief om eltelange lyste van literatuurverwysings by hul manuskripte in te sluit en dan te sê: 'Drie honderd en dertig navorsers deur die hele wêreld het nou al oontseggelik bewys ...'.² Wat hulle egter gewoonlik nie

sê nie is dat daar drie duisend ander navorsers is wat die teenoorgestelde gevind het. Dit help nie om te beweer dat honderde mense tog nie verkeerd kan wees nie; natuurlik kan hulle, mense moet net versigtig wees om nie ook hul foute vir soetkoek op te eet nie.

Die ander onderafdeling van die stofsuiër groep sluit die skrywers in wat nie 'n eie oordeel wil of kan vorm nie. Hulle trek vorentoe en agtertoe deur die wêreld literatuur soos 'n rangeerlokomotief op 'n besige stasie. Hulle haal graag 'n aantal artikels aan waarin die skrywers een standpunt gehuldig het om dan in die volgende sin 'n verdere lys te gee van diegene wat 'n ander siening het. Dikwels word daar dan weer 'n paar ander verwysings gegee wat verdere gedagtes verdedig en die arme leser moet dan maar self besluit wie hy moet glo. Die skrywer van die artikel voel dan dat hy sy objektiwiteit bewys het terwyl hy in werklikheid slegs kennis gegee het van sy eie onvermoë om 'n definitiewe standpunt in te neem.

Weens ons internasionale taalverwarring moet ons nog die verdere nadeel die hoof bied dat dit nie moontlik is om artikels in vreemde tale te lees nie. Hierdie onvermoë lei daartoe dat iedere taalgroep uiteindelik net sy eie navorsing erken en aanvaar. In dié opsig is veral die Engelsprekende lande geneig om hulself te isoleer en die werk van die vasteland van Europa grotendeels te negeer. Die enigste oplossing vir die dilemma sou wees om te verseker dat alle artikels ten minste 'n opsomming in een van die alombekende tale bevat en indien 'n navorsers dan uit die opsomming oordeel dat die inhoud van die artikel vir sy eie werk van belang is, behoort hy 'n vertaling te laat maak.

Ons beskik oor 'n magtige instrument tot geïntegreerde navorsing in die *Index Medicus*, en ons moet helaas erken dat ons daar nie altyd voldoende of korrekte gebruik van maak nie. Tensy ons nou die selfdiscipline aanleer om nie reeds gedane werk te ignoreer nie sal die steeds toenemende magdom van publikasies binnekort dreig om ons wetenskaplike pogings te verwurg en ons te lei tot die punt waar ons eie kennis ons ondergang kan bewerkstellig. Die leerkragte aan ons mediese skole moet dit hul ten doel stel om te verseker dat iedere student uit wans uit geleer word om intelligente gebruik te kan maak van die beskikbare wêreld literatuur sonder om óf die reeds gedane werk te misken, óf homself te laat verswelg deur die massa beskikbare materiaal.

1. De Villiers, J. F. v.d. S. (1969): *S. Afr. T. Geneesk.*, 43, 1211.