

EDITORIAL : VAN DIE REDAKSIE

### THE DOCTOR AND THE BOMB

It was with a measure of disquiet that we read a signed editorial article in a recent issue of the *Journal of the American Medical Association*.<sup>1</sup> It was entitled 'The Great Fallout Controversy', and was written by a Dr. Marshall Brucer, M.D., of Oak Ridge, Tennessee (where, incidentally, one of the laboratories of the US Atomic Energy Commission is situated).

The subject of this editorial is probably the most important issue facing mankind today, yet it is treated with a curious lack of gravity, and while the field is a controversial one, the conclusions reached—that there is no danger in distant fallout from atomic or nuclear explosions—do not seem to be supported by sufficient data.

The editorial opens by stating that the authorities told a lie after the Hiroshima bomb explosion when they said that distant fallout could be dangerous. It suggests that scientists who received research grants to investigate this problem perpetuated the 'lie' to receive bigger grants for more extensive experiments. It continues: 'The hysteria mounted until it reached its scientific peak with the recent press statement: "Scientists agree that (fallout) can cause . . . sterility, and mutations . . ."'

It then goes on, quite correctly, to divide fallout into 'close-in' and 'distant'—that which is carried up into the stratosphere after an atomic explosion. This is the paragraph dealing with distant fallout:

'The stratosphere is very large, very high, and very far away. Radioactivity in the stratosphere, no matter how much, doesn't hurt us. Except for an occasional space man the stratosphere is unpopulated. However, small amounts of this fallout eventually do trickle down into the biosphere. Once it gets close to earth, the debris is the same as close-in fallout. Rain and snow can bring it down faster. The essential point is that with distant fallout the radioactive isotopes stay in the stratosphere for a long time during which the fallout is diluted in a vast amount of space, the debris coming down very slowly, and decay makes the fallout less and less radioactive.'

Then the editorial describes the effects of close-in fallout in rather strange terms: 'If an atomic bomb explodes above your backyard, the explosion occurs in microseconds and you can't dodge it. If the fireball doesn't kill you, the blast will. If the blast doesn't kill you, the electromagnetic radiation will. If the gamma rays don't kill you, the neutron radiation will. Therefore, you will be killed four times, but it will happen so fast that you probably won't even feel the first death'.

Discussing the controversy about fallout, the editorial says that 'distant fallout—domestic, foreign or neutral—as long as there isn't enough of it, is not dangerous. The only scientific controversy is, "How much is too much?"' On this score it is stated: 'We have positive evidence that

there have been no more genetic abnormalities among the children of the exposed Japanese than among the non-exposed. . . this knowledge is not the result of diligent research. Ever since Isidore Rubin started to treat infertility by irradiating the ovaries of his patients in 1915, evidence has accumulated that even the patient's grandchildren have not been deleteriously affected by the initial exposure'.

The editorial sarcastically dismisses the statements of the 'news media and bureaucratic bubbleheads' that 'abnormalities may develop in the fifth generation or the sixth or even the seventh'. Suppositions are contemptuously pushed aside by Dr. Brucer. He says: 'This kind of political sloganry—"you may develop . . .," "you may be affected by . . .," "you may become . . ." resembles the advertising sloganry: "If you have leprosy and need salicylic acid, take aspirin." This is the worst kind of deception because it tells the truth'.

The final paragraph of the editorial reads as follows: 'Killing people with bows and arrows, machine guns, or close-in fallout is murder. This is not a problem in preventive medicine; it is the political problem of war. Distant fallout is not murder, but the encouragement of radiation hysteria—domestic, foreign or neutral—is immoral'.

While we do not disagree with many of the points raised by Dr. Brucer, we are completely at variance with his conclusions. In connection with the long-term effects of radioactivity, only the future will provide the full answer. This does not mean, however, that supposition can play no part—supposition, that is, based on as much scientific truth as we can muster. To us, the fact that the grandchildren of women whose ovaries were irradiated in 1915 were not deleteriously affected, does not gainsay the mounting evidence that the cumulative effects of radioactivity in the body may be deleterious. We concede that much of the radioactivity produced by an atomic explosion will disintegrate in the stratosphere. However, certain isotopes, such as strontium-90 and caesium-137, have half-lives of many years' duration. Sr<sup>90</sup>, for instance, has a half-life of 28 years, and it is one of the products of atomic explosions which filters back to earth in months or years from the stratosphere. Recently, we published an excellent review of work done on this subject;<sup>2</sup> it was pointed out there that the International Commission on Radiological Protection published, in 1959, its findings on the maximum permissible concentration of Sr<sup>90</sup> in the skeleton. If it accumulates above this figure (2  $\mu$ c.), somatic effects, such as leukaemia and sarcoma, will occur, apart from the possible genetic effects at lower levels. Caesium-137, with a half-life of 33 years, can be concentrated in the gonads.<sup>3</sup>

Since Sr<sup>90</sup> has a half-life of 28 years, who can say that the maximum dose will not be reached in the bones of any of us (especially in the northern hemisphere) if atomic tests in the atmosphere are continued on a world-wide scale in the years ahead? In June 1959, and this was before the large series of Russian tests last year, the concentration of bone-seeking beta-radioactivity reached a level of 167  $\mu\mu\text{c}$ . per litre in milk samples in New York, and Sr<sup>90</sup> represented 15 - 40 per cent of this level. It was stated that this was the result of the 1958 series of atomic tests.<sup>4</sup> We have 24 years to wait until this Sr<sup>90</sup> has disintegrated. Can we tell how much more will have been added to our food-stuff and our skeletons by 1986?

A few years ago, an editorial in *Medical Proceedings*<sup>5</sup> stated: 'The problem of the consequences of the amount to which our environment is being contaminated by radioactivity has ranged physicists and military strategists on the one hand and moral philosophers and biologists on the other, into two camps. On the whole physicists and their military colleagues are unimpressed by the possibility of genetic damage (immediate or remote), whereas biologists and moralists take a serious view of these risks. The problem of assisting Nature in this way is fundamentally an ethical one, but it is the duty of science to point out what unprecedented risks these artificial nuclear experiments may be creating'. It seems to us that Dr. Brucer and, by implication, the *JAMA*, range themselves with the physicists and military strategists in this controversy.

At the beginning of this month, President Kennedy announced that the USA will recommence atomic tests in April unless by then the USSR signs an effective treaty to ban tests. We fervently hope that such a treaty will be signed. However, if atomic tests are restarted, further contamination of the atmosphere by radioactive isotopes with long half-lives (such as strontium-90) will occur. The policy of this peace-time testing of atomic and nuclear weapons is purely a political and military matter and it is not within our competence to comment on this aspect of the subject. Our duty as doctors is however to try to decide whether continued tests of this nature are or are not likely to have an adverse effect on the health and well-being of mankind. It is clear that there are at present

two schools of thought in this matter: our quarrel with Dr. Brucer's editorial is that it too dogmatically dismisses the possibilities of fall-out danger.

In the same issue of the *JAMA* in which this controversial editorial appeared, a letter was published from a doctor in Chicago<sup>6</sup> who said: 'Most (physicians) believe that continuous pollution of the air, soil and water will result in increased incidence of leukemia, bone sarcoma, and carcinoma... It is well known that genes are affected by radiation; yet we physicians, as a group, are the most silent segment of society when we ought to be the most voluble, because it is with the health of mankind that we concern ourselves. We who employ a variety of inoculations to prevent comparatively minor problems, ought to be deeply concerned about this devastating problem facing mankind... and all scientists should direct their efforts toward solving problems of disease, and not toward the destruction of mankind'.

With these sentiments we are in complete agreement; our efforts at preventive medicine, which are such an important part of our role as doctors, fade into nothingness when we contemplate the enormous destruction of life which atomic or nuclear bombs can wreak in war, and which *may be (sic)* inherent in the continued testing of these bombs in times of peace.

The point we wish to emphasize most strongly is that, in approaching this vitally important issue, or any other controversial subject, we as doctors should always be ruled by one passion only — the search for truth based purely on scientific evidence.

Only in this way can we continue to keep the standards of our profession high and be in the forefront of the fight against natural and man-made disease. We are the inheritors of a tradition of service and truth that is thousands of years old; today, more than ever, it is our duty to humanity and to ourselves to maintain this tradition at all costs.

1. Editorial (1962): *J. Amer. Med. Assoc.*, **179**, 66.

2. Roux, J. P. (1962): *S. Afr. Med. J.*, **36**, 169.

3. Stevenson, A. C. (1958): *Practitioner*, **181**, 559.

4. Irving Sax, N., Haddon, W. and Wendel, O. W. (1960): *Amer. J. Publ. Hlth.*, **50**, 459.

5. Editorial (1957): *Med. Proc.*, **3**, 413.

6. Letters to the Journal (1962): *J. Amer. Med. Assoc.*, **179**, 98.

## HIDRAMNIOS

Hierdie betreklike seldsame (0.5 - 1%) verwikkeling in swangerskap is een waaraan nog veel onbekends vaskleef. Die normale hoeveelheid vrugwater mag beskou word as ongeveer 1 liter (1,000 ml.) by voltyd. Die term hidramnios dui aan dat meer as die gewone hoeveelheid vrugwater teenwoordig is vir daardie besondere stadium van swangerskap. Diagnose is dus klinies, m.a.w. dit word subjektief deur klinici self gemaak, met die gepaardgaande, onvermydelike meningsverskil. So, byvoorbeeld, voel Macafee<sup>1</sup> dat mindere grade van oormaat vrugwater net as sodanig bestempel moet word, en dat net waar daar só 'n oormaat is dat die geneesheer voel dat hy 'n röntgenfoto nodig het om te weet wat in daardie buik plaasvind, die toestand as hidramnios bestempel moet word. Die voorkoms daar-

van skyn in Ierland (in Dublin sowel as in Belfast) om onbekende redes hoër te wees as elders.

Die oorsaak van die toestand is onbekend; in werklikheid is die presiese oorsprong van die vrugwater nog nie finaal bepaal nie. Nietemin weet ons dat — nogal verbasend — die waterinhoud van die uterus ongeveer drie-uurliks totaal vervang word; fetale urinasie kan dus nie belangrik wees nie. Dikwels word geen moederlike of fetale abnormaliteite gevind nie, maar sekere toestande gaan só dikwels daarmee saam dat hulle dalk faktore in die etiologie mag wees.

Klinies kan daar onderskei word tussen akute en chroniese vorms van dié toestand. Die buik kan groot maar gestadige uitsetting goed weerstaan. Akute hidramnios is

seldsaam en ernstig, en kom vroeg voor, d.w.s. op 16-20 weke swangerskap, met ernstige, snel-ontwikkelende drukverskynsels. Röntgenfoto's mag vaag wees, maar hulle toon dikwels fetale abnormaliteite of (uni-ovulêre) tweeling aan. Herhaalde aftappings met lumbaalpunksienaalde deur die buikwand mag soms die swangerskap behou, maar gewoonlik lei dit tot 'n aborsie, of 'n aborsie word geïnduseer deur skeuring van die vliese. Vir die chroniese tipe is bedrus gewoonlik voldoende, en gelyktydige toksemie word soos gewoonlik behandel. Diuretiese middels is van twyfelagtige waarde by albei tipes. Waar abnormaliteite in die chroniese tipe bestaan, mag induksie d.m.v. hoë skeuring van die vliese die aangewese prosedure wees, want die vrugwater lek dan stadiger weg en die kans op skok, asook op infeksie a.g.v. mislukte induksie, word verminder. Waar die fetus vermoedelik normaal, maar die distensie onhoudbaar is, en mens tyd wil wen by uitgesproke voortydigheid, mag versigtige abdominale parasentese weer 'n redmiddel wees. In kraam moet dopgehou word vir wanligging of prolaps van die naelstring met die skeuring van die vliese en nageboortelike bloeding—deur tydige vaginale ondersoek en die toediening van oksitosiese middels.

Fetale abnormaliteite is dikwels geassosieer met hidramnios, en, hoe meer vrugwater daar is, hoe groter die kans dat abnormaliteite sal voorkom—veral wat betref anensefalie (wat heelwat meer algemeen in Ierland en selfs Engeland voorkom as hier plaaslik), maar ook esofageale atresie, spina bifida, ens. Hidramnios kom voor in ongeveer 12% van veelvuldige swangerskappe (soms net in een sak),

en dikwels in Rhesus-isoïmmunisasie met 'n hidrops fetalis-baba, maar nie met hidrosefalie nie. Die plasenta mag vergroot en swaarder wees as wat normaal is.

In 'n onlangse artikel uit Oxford<sup>2</sup> word daar op verskeie aspekte van die toestand ingegaan, met 'n omvattende opvolging van 114 vrouens met 132 swangerskappe wat deur hidramnios gekompliseer is. Die hoofbevindings was:

1. Die hoë voorkoms van fetale abnormaliteite.
  2. Geen vaste verband tussen hidramnios en moederlike ouderdom of pariteit nie.
  3. Die toestand neig om te herhaal by verdere swangerskappe. Die voorkoms skyn 1 uit 4 te wees vir verdere swangerskappe, teenoor net 1 uit 100-200 gewoonweg. Aangesien 1 uit 3 babas in gevalle van hidramnios wangeskape is, beteken dit dat dalk 1 uit 12 van die verdere swangerskappe na 'n hidramnios-gekompliseerde swangerskap, abnormaal sal wees. Hierdie feit is ook gestaaf in die Belfast-reeks.<sup>3</sup>
  4. Hiperemese en moederlike suikersiekte kom dikwels voor, soos ons reeds weet.
  5. Ons weet nog nie of die oorsprong van die toestand by die moederlike of fetale genotipe lê nie. Ten minste twee chromosoomafwykings gaan egter hiermee gepaard.
- Daar word ten slotte tereg opgemerk dat daar 'n dringende behoefte bestaan vir kliniese- en laboratoriumnavorsing op dié gebied.

1. Macafee, C. H. G.: Persoonlike mededeling.

2. Harris, G. H. *et al.* (1961): *J. Obstet. Gynaec. Brit. Emp.*, **68**, 800.

3. Macafee, C. H. G. (1950): *Ibid.*, **57**, 171.