disease epidemic in the *Annual Review of Phytopathology* (1973, **11**, 11–26). The authors have not even cited this work by Padmanabhan under references.

Plate 2 and plate 1 mentioned in that order, on p. 13, and plate 3 mentioned in p. 15 are not included in the print. The figures with incomplete descriptions do not help in understanding tungro. Only the figures and tables from more than a decade-old thesis work are given. Chapters have no clear titles nor do they contain any information that is not repeated several times.

'The disease progress is described by the logistic model (Madden *et al.*, 1990)'. Madden never studied tungro and this reference, on general nonlinear models, including the logistic model, is not cited under reference.

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PERSONAL NEWS

Victor Frederik Weisskopf (1908–2002)

Victor Frederik Weisskopf, the well-known theoretical physicist, died on 21 April 2002, aged 93 years, at Newton, Massachusetts, USA. In his passing away, the world of physics has lost one who enriched quantum physics, nuclear physics and elementary particle physics by his contributions for over six decades.

Weisskopf was born in Vienna, Austria on 19 September 1908. He received his Ph D from the University of Gottingen, Germany and subsequently worked at the University of Berlin with Erwin Schrödinger. Later, he was associated with Niels Bohr at the University of Copenhagen. During his long and productive career in theoretical physics, Weisskopf had worked, amongst others, with Max Born, Wolfgang Pauli and Albert Einstein. He chose to emigrate to USA in 1937 during the Nazi regime in Germany. On an invitation from J. Robert Oppenheimer, Weisskopf joined the Manhattan Project at Los Alamos, New Mexico during the Second World War to develop atomic weapons. He was one of the group members who witnessed the Trinity Test, the first test of an atomic bomb. Box 1 provides his eyewitness account of the blast.

Box 1. Weisskopf as an eyewitness to the Trinity Test

On 16 July 1945, at 5:29:45 am, the first atomic bomb was detonated at Trinity Site in New Mexico, USA. Weisskopf was at the base camp and watched the event from a little ridge through a dark glass and he had an indirect view of the landscape in order to see the deflected light.

In the words of Weisskopf, 'When the explosion went off, I was first dazzled by this indirect light which was much stronger than I anticipated, and I was not able to concentrate upon the view through the dark glass and missed, therefore, the first stages of the explosion. When I was able to look through the dark glass I saw flames and smoke of an estimated diameter of 1000 yards, which was slowly decreasing in brightness, seemingly due to more smoke development. At the same time it rose slightly above the surface. After about three seconds its intensity was so low, I could remove the dark glass and look at it directly. Then I saw a reddish glowing smoke ball rising with a thick stem of dark-brown colour. This smoke ball was surrounded by a blue glow, which clearly indicated a strong radioactivity and was certainly due to the gamma rays emitted by the cloud into the surrounding air. At that moment the cloud had about 1000 billions of curies of radioactivity whose radiation must have produced the blue glow.

'The first two or three seconds, I felt very strongly the heat radiation all over the exposed parts of my body. The part of my retina, which was exposed to the indirect light from the surrounding mountains, was completely blinded and I could feel traces of the after-image, 30 min after the shock'.

'The reddish cloud darkened after about 10 or 20 s and rose rather rapidly, leaving behind a thick stem of dark-brown smoke. After this, I remember having seen a white hemisphere rising above the clouds in continuation of the breakthrough of the explosion cloud through the ordinary cloud level'.

'The path of the shock wave through the clouds was plainly visible as an expanding circle all over the sky, where it was covered by clouds'.

'After about 45 s, the sound wave arrived and it struck me as being much weaker than anticipated'.

One is reminded of the statement of Oppenheimer that the explosion was brighter than a thousand suns.

Credit source: US National Archives, Record Group 227, OSRD-S1 Committee, Box 82 folder 6, Trinity.
http: //www.nuclearfiles.org/docs/1945/450716-weisskopf.html.

Box 2. Victor F. Weisskopf in conversation

Weisskopf, in an interview held in 1988 on International Affairs, in the series 'Conversations with History' by Harry Kreisler of the Institute of International Studies, University of California at Berkeley, expressed himself on many interesting aspects of theoretical physics and science of 20th century in general. The conversation included his reflections on responsibility of scientists and other moral and social aspects also.

As already noted Weisskopf studied, during 1932 to 1936 under Schrödinger at Berlin, Bohr at Copenhagen and Pauli at Zurich; that was a period when modern physics was taking shape.

- Speaking about those exciting times, he said: 'Of course, I came a little late; the great event was in the mid-twenties when quantum mechanics was formulated, invented and discovered. So at that time, quantum mechanics was already there, although a lot of necessary applications and extensions were not yet done. I felt a little like Alexander who said to his father, King Philip, "You have already conquered the world, what's there for me?" But there was a lot. It was a different time and there were fewer physicists... . And it was, in a way, a closed society. There were perhaps between fifty and a hundred people whom we knew all personally. There was a yearly conference in Copenhagen and they all came and this was the great event... At that time technical applications were still in the future, so even the interest of the public or of the technology of industry in what we did was not very great. Nevertheless, it was for us a tremendous time of new revelations'.

Hitler came to power in 1933 and Weisskopf said, 'At the time I was in Copenhagen, and I left Europe for the United States in 1937; these were the years of Hitler's ascent, and of course these were very tragic times for many of my relatives and people I knew well, and also for many of my colleagues. In some ways, I led a charmed life. I do not know how it came about, but somehow I never really suffered personally from any persecution. Of course I had difficulties finding jobs...'. 'And Bohr was very active in getting money from English, American, and Danish sources, to keep us there. I had, at that time, a stipend that was paid by the Carlsberg Beer Factory. I always drink Carlsberg Beer in gratitude for that. It was really admirable to see how Niels Bohr got jobs for his refugees – and very successfully so. For example, the job that I finally got, for the small instructorship at the University of Rochester, I thank him'.

- Weisskopf's views on 'What Makes a Scientist?' would be of interest to anyone interested in science.

In answer to a question, 'What is it at the root of scientific inquiry? What is the temperament that makes you a scientist?', he said: 'Well, I think that in a way, it's really simple. It's just being interested in what's around you; you want to know...'. 'If you are a scientist, you must be objective – facts, you know, you should not have your emotions play a role. I think that's all wrong. A scientific inquiry is a human activity. It's full of human drives – whatever you want ambition, joy, or tragedy, whatever you take – I try to bring out the emotional angle, the joy of insight, which I always try to emphasize, how wonderful it is when you suddenly, or not so suddenly, understand something and see, "Ah-ha! it's this way!" And that's an emotional experience which I think one has to transfer to the students...' 'One has to be careful not to be too taken away by emotions. In some ways it's in science too; without emotions you would not be able to do something great in science. I'm quite sure that for Einstein (especially because he speaks about it), the beauty of those ideas was very important to him, and that's an emotional reaction. So there is emotion even in science which people often suppress...'. 'The main point of complimentary ideas is that one way of looking at things, be it the scientific one, be it the religious one, be it the artistic one, is not enough, and deprives you of many ways of understanding your environment; but even more, it is very dangerous because if you only have one way of approach, it is open for abuse. We see it today in fundamentalism, creationism, and even worse in the East with Communism... but the fundamentalism shows that if you are in only one line – that's dangerous. Even the scientific technological line, if it is pursued without respect of anything other, namely moral, political or human aspects, leads to abuse as we unfortunately know about nuclear war and other things'.

- On 'Militarization of Science' and its consequences he observed: 'The arms race is an impossible thing because it is not a stable situation, for with every new invention there is a new spiral and it is the wrong idea that we can maintain superiority because the other side... are following us, even sometimes being ahead of us'.

In response to a comment that 'then it affects the problems that people can afford to look at' and whether it takes away the inquiring mind, he had this to say: 'I do not think that it can kill the fundamental scientific urge of basic science, which is very strong – there will always be people who will do it – but it takes money away, it takes manpower away and all this. These people (who go into military research) are very good, and if they went into basic sciences I think it would be better for the country also, not only from a philosophical point of view, but from a material point of view', and to some extent it is because there are not enough who worry about the peaceful applications'.

- Weisskopf, throughout his career, especially after the explosion of the atomic bomb, was actively engaged in promoting public consciousness on the nuclear threat and had much to say on the role of 'Scientists and the Peace Movement' to the public that nuclear war is unthinkable, and the armament race is extremely dangerous and the proliferation of nuclear arms is an irrecoverably dangerous point.

In answer to a query 'In this, do you see scientists as having a special responsibility?' he was outspoken: 'Yes, but perhaps one should not exaggerate this. The scientists have a special responsibility because perhaps they know somewhat more about the effects of a nuclear war, like nuclear winter or the destruction radioactivity produces

in the soil. But I do not think this is so important, because it is now well known. Therefore the role of scientists as citizens, not as scientists, is important. Actually the role of the social scientists is much more important now. What we need is innovation in social thinking'.

- In response to the comment 'the whole history of science that we are talking about has a positive side of internationalism, but there is a nationalist side also' he said, 'Of course, there is a nationalist side and we have to fight it, the fundamentalism both in this country and outside, although in this country perhaps it's not so dangerous...' 'Scientists, in order to be effective, have to have an influence on government and the Congress and public opinion'.
- The query 'What about the moral education of Victor Weisskopf? Clearly, you engage yourself in the problems of our time. What are the roots of that? Is it from the scientific inquiry?', brought out an interesting response: 'It's very hard to say. I believe that the home has a lot to do with it, the education at home, not in school but at home. That is the moral aspect, and I should emphasize that it does not come from religion – my home was not a religious home, but it was a very moral home. So in some ways, the rise of Nazism was, for us a moral education'.
- 'What lessons should one draw from this extraordinary 80-year odyssey? Do you have any particular insight you would like to leave with us?' got a response in a philosophical tone. 'I would say that this life has taught me that everything hangs together. This is the complimentarity: that you cannot be "a pure scientist and nothing else". Not only because of your own interests, you see. I think that if I were only a scientist and did not have music or art, and I did not have social problems, I would feel that my life was not so interesting. So in some ways, I would say it's education. ... We must have a better education, an education that emphasizes those ideals and the many-sidedness of things – science, art, religion and social responsibility. If we do get this into the minds of people, perhaps we can reduce the kind of cynicism and negativism that is now so rampant – drug culture, passive TV entertainment, and so on. Maybe I'm an optimist, but I think these are the points which I would take from my life as the important things for humanity'.

Credit:
http: //globetrotter.berkely.edu/conversations/Weisskopf/

After this experience and after the dropping of atom bombs over Japan by USA, Weisskopf turned out to be a pacifist. He founded the Federation of Atomic Scientists for campaign of peaceful uses of atomic energy.

In 1946, Weisskopf was appointed Professor of Physics at the Massachusetts Institute of Technology (MIT), where he worked until 1960.

Weisskopf's links with CERN at Geneva started in 1957 when he first went to CERN as a Guest Professor. He stayed for a year in the Theoretical Studies Division and took part in research work on the 600 MeV synchrocyclotron. A member of the Directorate in charge of research in 1960, he became CERN's fourth Director-General in August 1961. During the tenure of Weisskopf, the first attempts at experiments using neutrino beams began. In 1965, during his last year as Director-General, the CERN Council accepted a proposal for the construction of the Intersecting Storage Rings (ISR). CERN became the first international organization to span the frontiers of Switzerland and France.

Returning to MIT in 1965, Weisskopf continued his research and became Professor and Head of the Department of Physics, before retiring in 1973.

He used to return to CERN every year as a Guest Professor, lecturing in the Summer Students Programme.

Weisskopf's views on several aspects of science in general, militarization, education, social and moral values have been sought by many. Box 2 gives some selected excerpts from one of his interviews.

Weisskopf authored, co-authored and edited several textbooks and popular books. The book *Theoretical Nuclear Physics* (with Blatt, John Markus) served as a standard book to generations of students of nuclear physics. Some of the other books are *Joy of Insight: Passions of a Physicist*; *The Privilege of being a Physicist*; *Theoretical Physics in the Twentieth Century: A Memorial Volume to Wolfgang Pauli* (edited jointly with Fierz, Markus); *Physics in the Twentieth*; *Century: Selected Essays*; *Knowledge and Wonder: The Natural World As Man Knows It*; *Concepts of Particle Physics* (with Gottfried, Kurt); *Selected Stories from the Southern Review, 1965–1985* (edited jointly with Fierz, Markus and Olney, J.); *Physics and Society: Essays in Honor of Victor Fredrick Weisskopf by the International Community of Physicists* (with Victor Frederick and Stefan, V.).

Weisskopf was chairman of the High Energy Advisory Panel of the AEC from 1967 to 1973. His awards include the Max Planck Medal, Hi Majorana award, G. Gamow award, Boris Pregel award, L. Boltzmann prize, National Medal of Science (US) and the Wolf prize.

Weisskopf was an active member of Pugwash. He was also President of the American Academy of Arts and Sciences, and member of the Pontifical Academy of Science. In addition to being a corresponding member of the French, Austrian, Danish, Bavarian, Scottish, Soviet and Pontifical Academies of Science, Weisskopf was a Fellow of the American Physical Society, where he served as president in 1960. He was also a member and former president of the National Academy of Science and American Academy of Arts and Science.

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