



Joshua Lederberg

Israel's Weizmann Institute Traces the DNA of a Virus

REHOVOTH, Israel—During the first day of the Six-Day War, Nasser's propaganda broadcasts to the Egyptian people boasted that "Tel Aviv was in flames. The Weizmann Institute has been utterly destroyed." This was, happily, only inflamed imagination, but it illustrates the prestige of this privately endowed center of scientific research.

It is a sobering reflection that far more consequential things are happening inside the institute's laboratories than on the stormy political, diplomatic and propaganda fronts. Which of the many lines of research to discuss here is a matter of personal taste and I will simply use one item that echoes some of my own scientific interests in genetics.

DR. ERNEST WINOCOUR is a native of Glasgow who was trained in Britain, the United States and the Hebrew University of Jerusalem. For some time he has been working on the polyoma virus.

These particles can be grown on hamster or mouse or other species' tissue cells. In the laboratory, the polyoma virus will induce multiple tumors (hence the name, poly- and -oma) but only when injected into newborn animals. There is no evidence that the virus induces any disease by natural transmission, or in man. However, it is a fascinating theo-

retical model for cancer biology.

The biological origin of such viruses is obviously a subject of great interest, and it was provocative to find chemical evidence for some similarity between the DNA of the virus and DNA from normal cell nuclei. This would strongly suggest that the virus had originated by some mutation of a part of the normal chromosome and would be an important step in unraveling how the virus induces tumors.

ON CLOSER study, however, the virus particles are found to be separable into two kinds. About 80 per cent are typical virus particles, are infective and show very little homology with normal DNA. The remaining 20 per cent are non-infective and contain a different kind of DNA from the typical virus.

Instead, this DNA closely resembles that of the nuclei of the host cells. Dr. Winocour concludes that these particles represent an entrapment of host DNA within the enveloping "capsids" or outer skins of the virus. The situation is reminiscent of the phenomenon of transduction in bacteria, whereby virus particles can carry host-cell genetic information to new cells.

This is the most obvious point of the story, and the possibilities of a similar genetic transfer in mammalian cells are being actively studied.

THERE IS more to reflect upon—how much more we have to learn about every virus, particularly the ones we use in mass immunization programs, by the application of more sophisticated techniques of physico-chemical analysis.

Finally, how preposterous it is that the United States should now find itself, or believe itself, to be in such financial stringencies that it must systematically retrench its support of international science programs. These have an immediate and indispensable benefit for the extension of the scientific knowledge in which all countries share and the United States to the greatest advantage.

There is, furthermore, no more consistent basis of international understanding than such a sharing of knowledge on a common

standard of critical objectivity, so rare in other spheres of human action.

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