of results from strictly local mappings between neighboring points in successive frames.

As a control experiment to verify that this superior discriminability of the coherent spherical pattern was associated with its three-dimensionality, we also examined performance under an analogous set of conditions with two unconnected but superimposed rectilinear plane patterns. The pattern of results for these planar patterns was very different, with no superiority in the detectability of the perfectly correlated pattern, no effect from small reductions in the correlation, and a competitive interference rather than global organization between two planes displaced in opposite directions.

Thus, a single discrete projective transformation provides sufficient information for the detection of structure and motion in three dimensions. The underlying visual process is self-organizing, yielding a nonlinear stability sensitive to the global coherence of the changing optical pattern.

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6. The perspective of the projective mapping correspond to positioning the convergence point one sphere-diameter away from the center of the sphere. This corresponds to a 3:1 ratio of the distance of the farthest to nearest points, and a 3:1 ratio in the extent of projected displacements of points on the nearest front and farthest rear surfaces when the sphere was rotated. While this amount of perspective was greater than would have corresponded to the viewing distance between display and observer, we have found that such perspective is necessary for detecting the three-dimensional structure in these displays.
7. Detectability of the organized structure of these patterns deteriorates with interstimulus intervals as brief as 50 msec.
8. The correlations of dots on the front and rear surfaces of the sphere were separately manipulated. The data have been averaged over these two conditions because there was no consistent difference between them. This was confirmed in a supplementary experiment specifically devoted to the comparison of these two conditions. The similarity of performance in the two conditions is remarkable because the projected spatial density and extent of displacement under motion was as much as three times greater on the front surface. Moreover, the observers reported not even seeing the motion of dots on the front surface. Perturbations of the dot positions were equally disruptive on either surface, however, indicating that the global coherence of the entire sphere was detected.
9. The special stability of the fully correlated pattern contrasts slightly with results recently reported by J. T. Petersik [*Percept. Psychophys.* **25**, 328 (1979)], who found that subjective judgments of the coherence and depth of a continually rotating sphere could be maintained even under large amounts of visual noise.
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T-1 Cells Are HeLa and Not of Normal Human Kidney Origin

The T-1 cells used by Furcinitti and Todd (*1*) and by many other investigators in radiation biology (*2*) are supposed to have originated from the kidney tissue of an 8-year-old boy operated on in 1957 for kidney stones (*3*).

When we learned that T-1 cells cultivated in the United States were suspected of bearing cytogenetic resemblance to HeLa cells (*4*), we studied samples of T-1 cells from laboratories in the United States and from the Netherlands, where T-1 originated. Our aim was to determine (i) whether all T-1 cultures were of the same cell line and (ii) whether the cultures by karyologic and enzymatic tests as well as histocompatibility antigen (HLA) typing were either unique and different from or identical with HeLa cells.

Monolayer cultures were received from the initiator and four other laboratories (*5*). All grew as patches of cells with epithelial-like morphology; a few cells were spindle-shaped. Conventional chromosome preparations were examined as well as Q- and G-banded preparations. Chromosome numbers per metaphase ranged from 56 to 70 and the modal numbers were 66, 64, 65, 65, and 65, respectively, for cultures listed in Fig. 1. Control HeLa S_3 cells also grew with epithelial-like morphology, 54 to 70 chromosomes, and a modal number of 67 per cell. With reference to Fig. 1, we emphasize three points. (i) The same combination of complex rearranged chromosomes or markers was found in one randomly chosen cell from each T-1 culture and a HeLa cell. These multiple markers have been observed in every cell of many HeLa strains and cell lines contaminated by HeLa cells (*6*). Markers with similar banding patterns have appeared singly in cells of other tumor cell lines and, in one instance (*7*), more than one was described in selected cells of a breast cancer effusion. They have not to

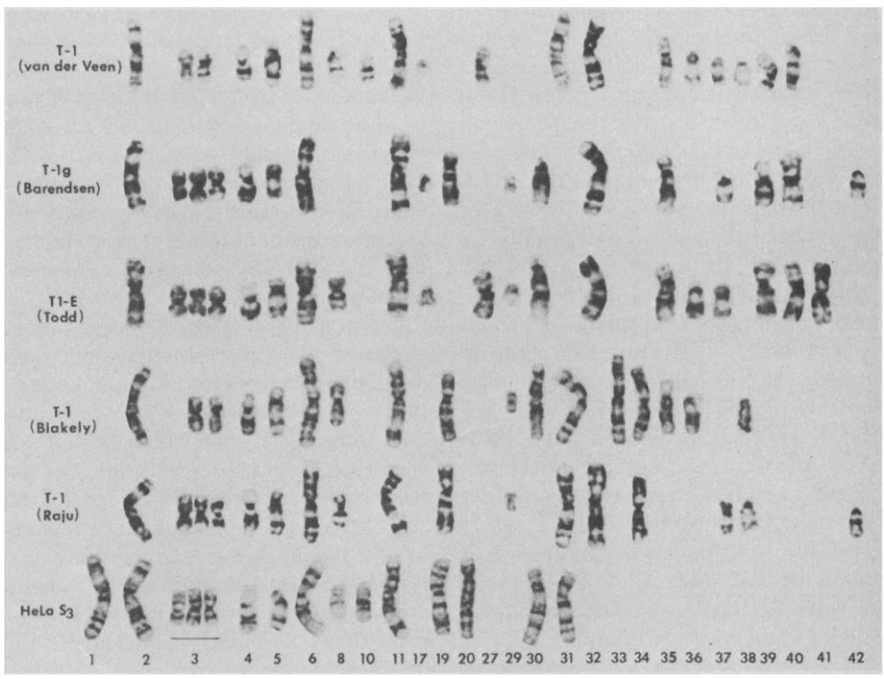

Fig. 1. G-banded marker chromosomes from one metaphase of each of five T-1 cell cultures and from HeLa S_3. HeLa marker No. 1 is absent from the T-1 cultures. All cells have at least six identical markers, and all cells have unique rearranged chromosomes. HeLa markers 1 to 29 are numbered according to the previous standard (*6*); markers 30 to 42 appear to be unique for these cultures.

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our knowledge been reported in concert in cells of any long-term cultured human line other than HeLa. (ii) That none of the cultures exhibited marker No. 1, found in HeLa S_3 and many other HeLa strains, indicated the likelihood of a clonal derivation of all T-1 cultures. (iii) Continuing chromosome evolution in isolated strains of T-1 is inferred from the presence in each cell of additional unique markers. No metaphase in any of the cultures revealed a Y chromosome.

The five cultures were tested by gel electrophoresis for eight gene-enzyme systems (*8*). The allozyme phenotype of the cultures was identical to that of HeLa cells for these enzymes and conforms to previously published results. The probability of a genotype at these eight loci in an individual cell line being identical to HeLa is .0017 (*8*).

Results of HLA typing revealed an identical phenotype in all cultures, namely, a positive reaction for HLA-A2 antigen and negative results for HLA-A1, A3, A9, A10, and HLA-B5, B7, B12, B17 antigens. These results conform to the uncommon phenotype of HeLa cells that are found when a sensitive absorption procedure is used (*9*).

HeLa cells were present in the laboratory of origin at the time T-1 was initiated (*3*). During its establishment, initial proliferation diminished after one passage and 28 days in culture. By the end of 2 months it was noted that one of the original six tubes planted showed islands of epithelial cells of normal appearance which 5 days later could be transferred and proliferated rapidly. It is likely that these were, in fact, contaminating HeLa cells, descendants of one or a few HeLa cells.

The many conclusions based on experimental results obtained with the use of T-1 cells must be reevaluated in view of the origin of the cells and depending on the nature of the experiments. If a human cell, whether normal or tumor, sufficed in the protocol, the conclusions drawn remain sound. However, if one intended to collect data on normal, presumably diploid cells derived from kidney tissue of an 8-year-old male, most likely of Caucasian origin, and had, instead, used adenocarcinoma-derived heteroploid cells from the uterine cervix of a 31-year-old black woman, this would not be the case. Meanwhile we continue to search for long-term cultivated human cells of normal kidney origin.

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Dopamine Auto- and Postsynaptic Receptors: Possible Interference by Gallamine

Skirboll *et al.* (*1*) have provided data suggesting that dopaminergic autoreceptors in the substantia nigra are much more sensitive to small doses of dopamine agonists than many of the postsynaptic dopaminergic receptors in the caudate nucleus. The investigators may have introduced an artifact in their study, however, by using gallamine to immobilize the experimental animals.

Gallamine, a synthetic tubocurarine analog, is widely used because of its well-known blocking action of acetylcholine at the muscle end-plate receptors. Less well known is that gallamine may have a central anticholinergic action as well. When systemically administered, gallamine passes from blood into the cerebrospinal fluid (*2*), and it also exerts a direct action on the central nervous system as demonstrated by electrophysiological studies (*3*).

Although the precise interrelationships of the cerebral cholinergic and dopaminergic systems are not known, the two systems appear to be mutually antagonistic at a behavioral (*4*) as well as at a biochemical level (*5*), and they occupy overlapping areas in the substantia nigra and some other regions of the central nervous system (*6*). Among several possibilities, it has been proposed that acetylcholine could act at these areas as a presynaptic modulator of dopaminergic neurons (*7*).

The studies of Skirboll *et al.* were performed on the pars compacta of the substantia nigra and on the caudate nucleus. Besides their high dopamine content, these two regions display prominent acetylcholinesterase activity, suggesting that they are important sites for cholinergic-dopaminergic interaction (*7*). The response of these regions to either the systemic or the iontophoretic application of dopamine agonists is likely to be affected by cholinergic modifications induced by gallamine or other agents.

Although the central actions of systemic gallamine have been largely ignored, its use in a study of central dopaminergic mechanisms throws the validity of the results into serious question.

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