cence of age-regression, either with or without hypnosis, are similar to those obtained from subjects of comparable chronological age. With regression to age 9, there is decrease in the magnitude of the illusion, identical with that obtained with variation of chronological age; with further regression to age 5 there is further decrease in the magnitude of the illusion, which is less marked.

Analysis of variance leads to rejection of the hypothesis that the means for the four conditions are equal: F, 7.27; $P < .01$. A Newman-Keuls procedure (*6*) was employed for determination of which pairs of treatment means differed significantly: with the exception of the difference between conditions of no hypnosis and hypnosis–no regression, all mean differences are significant at $P < .05$.

The trend is similar with the Poggendorff illusion (Fig. 1B). The magnitudes of the illusion in the absence of age-regression and for the 9-year age-regression group are essentially identical with those already obtained, while the data for the 5-year group are in the same direction but less marked. Analysis of variance leads to rejection of the hypothesis that the means of the four conditions are all equal: F, 4.10; $P < .05$.

A Newman-Keuls procedure, computed to determine which pairs of the treatment means differed significantly, revealed significant difference between the conditions of no hypnosis and hypnosis with regression to age 5, and between the conditions of hypnosis and hypnosis with regression to age 5, at $P < .05$.

The data for the control group, obtained under the condition of no task-motivation, were statistically equivalent to those obtained from subjects of the same chronological age: 1.74 cm for the Ponzo and 2.39 cm for the Poggendorff. Under the task-motivation instructions, the values of both illusions increased; for the Ponzo illusion the change was opposite to that obtained at younger ages, the mean value being 2.50 cm; for the Poggendorff figure, 3.23 cm.

Our data indicate that age-regression instructions under hypnosis result in magnitudes of illusion that are more typical of younger ages than of the chronological ages of the subjects. The control data, as well as the fact that our subjects had no knowledge of the developmental functions for these illusions, support the position that the subjects were using or failing to use visual cues in a manner appropriate to earlier stages in perceptual development. Whatever processes of perceptual development are responsible for the observed changes in the magnitude of these illusions as functions of chronological age, they are apparently not irreversible. Such results are also of theoretical importance for understanding of the mechanisms of hypnosis; at the same time they provide a methodology for the study of developmental changes in perception.

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References and Notes

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Wastes from Fusion Reactors

We wish to prevent a possible serious misinterpretation of a recent report by one of us (*1*). For each 1000 Mw_e of power produced daily by a deuterium-tritium nuclear-fusion reactor, some 3×10^6 curies of tritium will be produced in a surrounding moderator, and a larger quantity will be continually circulated through various parts of the system. It is the intent in such systems to generate excess tritium to compensate unavoidable losses and to provide more fuel in the sense of a "conventional" nuclear breeder. Apparently the report can be interpreted to mean that the entire excess may eventually be vented to the atmosphere—directly, or indirectly when tritiated components are serviced, reprocessed, or otherwise treated. Such release of tritium would be serious, although by no means comparable to an equivalently large release of material from a fission breeder.

In fact no such release of tritium will take place in practice, not only because of considerations of radioactive contamination, but also because the excess tritium is absolutely essential to operation of any deuterium-tritium fusion system. Tritium decays at 6 percent per annum; estimates of the tritium inventory required in a fusion reactor vary markedly at this early stage of the research, but the amount may well be fuel supply for 1 year. This large requirement results from temporary holdup in such things as surcharged structural components and reprocessing time for vacuum-pump material. Thus, with a breeding ratio of 1.15 to 1 (tritium produced : tritium consumed), the postulated inventory implies an excess of 9 percent per annum. The fuel-doubling time will be 8 years; a longer time would be economically uncomfortable.

In addition to these needs, the fusion system must compensate the loss in surcharged system components from which it is not economic to recover the tritium. This "loss" is better described as a permanent holdup; it does not lead to a general contamination problem unless the tritium-containing materials are mishandled. Under any controlled-fusion scheme envisaged, these materials will be disposed of in such a way that no hazard will ensue. The radioactive contamination will be mild compared with that from fission-reactor components; generally the statement that fusion reactors produce little radioactive waste to be discharged to the environment is true. This fact should not imply that there are not large quantities of radioactive tritium to be handled.

The point made in the report that new schemes must be developed for expeditious handling of tritiated materials deserves attention. The amounts of tritium in use will be vastly larger than those to which we are now accustomed, and present methods of controlling tritium, applied during reprocessing of fission-fuel elements (that virtually ignore trace amounts), will certainly not suffice for handling of fusion-system components. Suitable schemes must be (and certainly will be) developed to match the peculiar problems posed by fusion-power systems.

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