summary and the full narrative. Because concepts are stressed and scientific terminology is minimized, this program could be used successfully with junior/senior high school and adult groups. Part II is especially beneficial for high school teachers who wish to present the *concept* of genetic engineering using recombinant-DNA knowledge and technology.

Jon R. Hendrix
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Birth of a brain. CRM/McGraw-Hill, Del Mar, CA. 1983. 16 mm color/sound film. 33 minutes. Film purchase/rental $525/$75, videocassette purchase $395.

Both literally and figuratively this film deals with the birth of a brain. There is a graphic birth scene in the first two minutes, the justification for this is probably that there is a recording electrode in place on the vertex of the emerging cranium. Four minutes into the film, the newborn infant is attempting to suckle at her mother's breast, which portrays a new inborn reflex or behaviorism. These observations are noted because some viewers might regard this footage as a bit of "media" sensationalism. The setting is in a modern French hospital, with an attractive French couple, and the maternity ward, nursery, and hospital details are colorful, pleasant, and interesting. However, from the biologist's standpoint, about one-fourth of the film is composed of "filler" material for its entertainment value. An exception to this criticism would be if the film is utilized in the subject areas of developmental psychology, child development, or nursing. The promotional literature is oriented to these subject areas in addition to introductory biology and neurophysiology.

The development of a child's brain is taken from its embryogenesis (20 days postconception) through gestation and up to the second year postnatally. Impressive microphotography, sonography, computer graphics and endoscopic viewing with the hysteroscope, present views and perspectives that were impossible until just a few years ago. Cell division is proceeding at 250,000 mitoses per minute by the fifth week of gestation; circuitry connections and networks of neurons reveal structured organization during the seventh week; neurons push out processes that search about and establish contacts with other nerve cells and embryonic muscle fibers. After 13 weeks of rapid cell division, tissue induction, and organ development, the fetus exhibits flexion movements of the fingers, arms, and feet; reflexes mediating suckling, swallowing, and urinating become evident. Endoscopic and microphotographic views of these processes and systems provide attention-getting scenes of remarkable clarity and novelty. The grapefruit-sized brain of the newborn, containing around 14 billion neurons, is viewed by sonography, and its several regions are considered. Only the brain stem, controlling primitive survival functions, is operational at birth, and only the white matter in the center of the brain has myelin sheathing for efficient transmission of nerve impulses or messages.

Each period in the developmental sequence, from embryo to fetus to newborn to two-year-old, is given brief but accurate photographic coverage, with little use of animation or models. For example, the cerebellum, beginning its formation one month prenatally, is portrayed anatomically and physiologically. Then its function in control and coordination of fine motor acts, correlated with Purkinje cell appearance and circuit formation, is followed.

The brain and certain parts of the nervous system are studied, utilizing state-of-the-art film techniques, during the stages of embryogeny, birth, and infancy. Psychological and behavioral concomitants are effectively depicted for each level of development. The film ends as the baby's vocalizations begin.

The intended audience is high school, college, and adult. It would be a valuable adjunct for these groups, but it is advisable to preview it since it contains explicit scenes of parturition and lactation.

Raymond E. Henzlik
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Topics in genetics: genetic engineering. 1983. Prentice-Hall Media, Tarrytown, NY. Filmstrip with cassette. 14 minutes. $55.

This presentation of the elements of recombinant DNA work is suitable for use in introductory and possibly advanced high school biology courses. Some specialized vocabulary is assumed—such words as "plasmid and transformation" are used with minimal definition. The drawings and photographs are clear, illustrative, and where appropriate, well labeled although the accuracy of labeling in one case is uncertain.

The program begins with the assertion that the exchange "of genetic material between different species is prevented by natural barriers." A discussion of specific procedures, using Eco R1 as the model enzyme and the plasmid $_pSC_{101}$ as the model vector is introduced by showing how the discovery of restriction endonucleases led to the development of "shotgun" recombinant DNA production. The use of double antibiotic resistance for locating transformed cells is briefly explained.

The question of accidental production of toxic materials, the famous Asilomar guidelines, and local governmental actions concerning them is discussed. The prescribed physical containment provisions are described in considerable—perhaps excessive—detail. Biological confined is mentioned only briefly.

The cloning of rDNA (although the term is not used) is presented, starting with isolated mRNA and using reverse transcriptase as the principal enzymatic tool. The process of cloning synthetic genes for small proteins is described. Some emphasis is placed on products obtained through these techniques, especially somatostatin, interferon, and insulin.

It is perhaps unfortunate that more emphasis is placed on the social implications of possible dangers from recombinant DNA work than on the benefits to be derived from it. Nevertheless, the program does present a degree of balance and at least a slightly more than cursory introduction to this exploding area of biotechnology.

The cassette is arranged for use with both audible and inaudible sound cues and the program is accompanied by a booklet containing the complete script, a glossary, and some multiple-choice questions with answers.

Werner G. Heim
The Colorado College
Colorado Springs, CO

Cell differentiation: the search for the organizer. 1984. Coronet Films, Chicago, IL. 16 mm color/sound film. 15 minutes. $343.

This film, programmed for senior high school and college students, is one of the most interesting of all audiovisual materials I have encountered on cells. It recreates the work of the famous embryologists Hans Spemann and Walter Vogt.