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ROCHESTER INSTITUTE OF TECHNOLOGY

A THESIS SUBMITTED TO THE FACULTY OF
THE COLLEGE OF FINE AND APPLIED ARTS
IN CANDIDACY FOR THE DEGREE OF

MASTER OF FINE ARTS

COMPUTERIZED MEDICAL ILLUSTRATION

BY

CYNTHIA E. DUFFER

OCTOBER 1985

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COMPUTERIZED MEDICAL ILLUSTRATION

BEING A PRACTICAL PERSONALITY, I WANTED INFORMATION ABOUT THE POSSIBLE MARKETS AND USES FOR MY MEDICAL ILLUSTRATION TALENTS. THERE MUST BE NEW GROWTH AREAS AND UNTAPPED MARKETS. MY THESIS WILL REVOLVE AROUND AREAS THAT ARE UNTRADITIONAL, GAINING USAGE AND HOLD GREAT POTENTIAL FOR MORE THAN ONE MARKET.

FIRST, I NEEDED TO KNOW WHAT POTENTIAL MARKETS WERE AVAILABLE FOR MY SKILLS. I SET ABOUT THIS TASK, BY TAKING A CLOSE LOOK AT MY COMMUNITY, TALKING TO INSTRUCTORS, MEDICAL ILLUSTRATORS I KNEW, FORMER STUDENTS OUT IN THE MARKET PLACE AND DOING RESEARCH IN THE CITY LIBRARY. I CALLED THE OBVIOUS USERS OF MEDICAL ILLUSTRATORS, HOSPITALS AND PUBLISHING PHYSICIANS, GOT ON THE PHONE AND SPOKE TO BUSINESSES, AND I WENT OUT TO PHARMACEUTICAL COMPANIES. MEDICAL ILLUSTRATION IS A MARRIAGE OF MEDICAL AND SCIENTIFIC KNOWLEDGE WITH ARTISTIC SKILLS, BUT NO SKILL OR TALENT IS OF ANY USE UNLESS IT FINDS PURPOSE AND AN AUDIENCE WHO BENEFITS FROM IT.

FOR CLARITY, I HAVE BROKEN DOWN THE MAJOR MARKETS AND NEW GROWTH AREAS THAT HAVE POTENTIAL USE FOR MEDICAL ILLUSTRATION, INTO SIX TOPICS: HOSPITALS AND PUBLISHING PHYSICIANS, GOVERNMENT AND NON-PROFIT HEALTH ORGANIZATIONS, PERIODICALS, TELEVISION, BUSINESS AND COMPUTER GRAPHICS. FROM THERE, I WILL DISCUSS WHAT

IMPACT THIS INFORMATION HAD ON MY THESIS PROJECT AND GO INTO
DETAIL ON THE THESIS PIECES INDIVIDUALLY.

IT HAS BEEN FIVE HUNDRED YEARS SINCE THE FAMOUS ANATOMICAL TEXTS AND DRAWINGS OF LEONARDO DA VINCI TO THE PRESENT; THE MARKET FOR ANATOMY TEXTS IS PRETTY WELL GLUTTED. YET MEDICAL ILLUSTRATION IS COMMONLY THOUGHT OF IN OLD TRADITIONAL TERMS. DETAILED ANATOMICAL RENDERINGS ARE INDEED A PART OF MEDICAL ILLUSTRATION, ALBEIT, A SMALL PERCENTAGE. IT IS SIMPLY MORE COST EFFECTIVE TO REVISE EXISTING, WELL KNOWN VERSIONS, THAN TO CONTRACT A NEW EDITION. SO WHERE DO MEDICAL ILLUSTRATORS MARKET THEIR SKILLS?

HOSPITALS AND PUBLISHING PHYSICIANS

CALL MOST HOSPITALS AND ASK FOR THEIR "DEPARTMENT OF MEDICAL ILLUSTRATION"; EIGHT TIMES OUT OF TEN, THERE WILL BE NO SUCH DEPARTMENT, OR IF THERE IS A STAFF ILLUSTRATOR, THE DEPARTMENT IN WHICH HE/SHE WORKS WILL BE "AUDIO-VISUAL SERVICES" OR "MEDICAL PHOTOGRAPHY AND BIOMEDICAL COMMUNICATIONS". THERE WILL USUALLY BE NO MORE THAN TWO PERMANENT STAFF ILLUSTRATORS, IF THERE ARE ANY AT ALL. MOST OF THE WORK THE ILLUSTRATOR WILL DO WILL BE CHARTS, GRAPHS, HOSPITAL SERVICE PROMOTIONAL ITEMS AND MEDICAL ILLUSTRATION WHEN NEEDED.

MEDICAL ILLUSTRATORS ARE KNOWN AS COSTLY HIGHLY SPECIALIZED ARTISTS, WHO ILLUSTRATE SURGICAL TEXTS, MEDICAL JOURNALS, AND PHYSICIANS' TREATISES. SURGICAL TEXTS ARE LONG TERM AFFAIRS AND VERY COSTLY. BECAUSE OF THIS, ONLY A FEW ARE PUBLISHED YEARLY. ONLY A FRACTION OF MEDICAL ARTISTS LAND SUCCESSIVE

SUSTAINING CONTRACTS. MOST MEDICAL ILLUSTRATORS OPERATE ON A FREE-LANCE BASIS WITH ONE OR MORE PHYSICIANS/ SPECIALISTS IN A NUMBER OF LOCATIONS. A WELL KNOWN ILLUSTRATOR MAY NAME HIS PRICE AND DO QUITE WELL WITH TWO TO FOUR PUBLISHING PHYSICIANS. INCIDENTALLY, A HOSPITAL MAY SUGGEST AN ARTIST TO A DOCTOR SEEKING MEDICAL ILLUSTRATION SKILLS, BUT IT IS USUALLY THE DOCTORS' RESPONSIBILITY TO FIND HIS OR HER OWN ILLUSTRATOR.

MOST HOSPITALS CAN NOT AFFORD A COMPETITIVE SALARY AND BENEFIT PACKAGE FOR STAFF ILLUSTRATORS, SO THEY KEEP ILLUSTRATORS ON FILE AND PAY FREE-LANCE PRICES FOR NEEDED SKILLS. WORKING IN A HOSPITAL SETTING, AN ILLUSTRATOR MUST BE ABLE TO DO A BIT OF EVERYTHING: PASTE-UP, GRAPHS, CELLS FOR SLIDE SHOWS, PAMPHLET DESIGN, EXHIBIT DESIGN AND ILLUSTRATION. DESPITE THE DIVERSIFIED SKILLS REQUIRED OF THE MEDICAL ILLUSTRATOR WORKING IN A HOSPITAL, HOSPITALS USUALLY REFLECT THE LOWEST PAYING MEDICAL ILLUSTRATION SALARIES.

THE OBVIOUS TRADITIONAL MARKETS OF PUBLISHING DOCTORS AND HOSPITALS ARE JUST THE "TIP OF THE ICEBERG", SO TO SPEAK, OF POSSIBLE JOBS AVAILABLE. TODAY'S SOCIETY IS BASED UPON VISUAL IMAGES, LESS ON THE WRITTEN WORD AND MORE PERSONAL TIME IS SPENT VIEWING FAST PACED COMPACTED MEDIA, SUCH AS TELEVISION, FILMS, PAMPHLETS AND PERIODICALS. THE PUBLIC EXPECTS SPECIALIZED SUBJECTS, LIKE MEDICAL ADVANCES, DISEASE, MEDICAL PROCEDURES AND TREATMENTS, TO BE AVAILABLE TO THEM IN A DIGESTIBLE MANNER. CHILD SIMPLE EXPLANATIONS OR "IT'S TOO COMPLICATED FOR LAYMEN" EXCUSES, WILL NO LONGER BE TOLERATED. FOR EXAMPLE, THE ARTIFICIAL

HEART TRANSPLANTS DONE IN LOUISVILLE, KENTUCKY, WERE LAVISHLY EXPLAINED BY DOCTORS; HEART PUMP DIAGRAMS AND ILLUSTRATIONS OF THE EXPERIMENTAL SURGERY WERE SEEN ACCROSS THE NATION ON T.V., IN NEWSPAPERS AND MAGAZINES. BABY FAE'S BABOON HEART TRANSPLANT AND PRESIDENT REGANS' COLON SURGERY WERE ALSO EXPLAINED IN DETAIL IN THE MEDIA. NOW, MORE THAN EVER, THE PUBLIC IS WILLING TO PAY FOR MEDICAL INFORMATION, AS WELL AS, TREATMENTS AND MEDICINES.

GOVERNMENTAL AND NON-PROFIT HEALTH ORGANIZATIONS

HEALTH CARE AGENCIES AND ACCESSORY ORGANIZATIONS ARE ENGULFING ENORMOUS AMOUNTS OF TAX DOLLARS; THE PUBLIC PAY THESE COSTS AND ARE DEMANDING AN EXPLANATION OF WHAT AND HOW THEIR DOLLARS ARE BEING SPENT. THE 1985, STATISTICAL ABSTRACT OF THE UNITED STATES, 105TH EDITION, STATES THE FOLLOWING HEALTH CARE SHARE OF THE BUDGET, AS WELL AS, NATIONAL HEALTH CARE EXPENDITURES:

DATA: 1983/ HEALTH PROGRAMS	BILLIONS DOL.
MATERNAL & CHILD HEALTH PROGRAMS.....	1,016.
PUBLIC HEALTH ACTIVITIES	11.
VETRANS HOSPITALS/ MEDICAL	7,660.
DATA: 1983/ NATIONAL HEALTH EXPENDITURES	BILLIONS DOL.
DRUGS & SUNDRIES	23.7
EYGLASSES AND APPLIANCES	6.2
NURSING HOME CARE/ HEALTH SERVICES	37.3
DATA: 1984/ FEDERAL OUTLAYS FOR HEALTH	MILLIONS DOL.
HEALTH RESEARCH	4,434.
CONSUMER SAFETY	769.
EDUCATION & TRAINING OF HEALTH CARE WORKFORCE	442.

FEDERAL OUTLAYS FOR HEALTH CONTINUED:	MILLIONS DOL.
RESEARCH TRAINING	205.
CLINICAL TRAINING	200.1
OCCUPATIONAL SAFETY & HEALTH	373.1

THE PERCENTAGE AMOUNT OF THESE FIGURES, THAT IS ALLOCATED FOR PUBLISHING LITERATURE, SLIDE SHOWS/ VIDEOS AND SUPPLEMENTAL HEALTH CARE INFORMATION IS NOT AVAILABLE. BUT IN MOST COMMUNITY HEALTH AGENCIES AND GOVERNMENTAL AGENCIES, ILLUSTRATED BOOKLETS, PAMPHLETS AND MANUALS ARE AVAILABLE FOR NOMINAL FEES OR FREE OF CHARGE. HERE IS A LIST OF WELL KNOWN HEALTH AGENCIES, BOTH GOVERNMENTAL AND NON-PROFIT, THAT UTILIZE MEDICAL ILLUSTRATION IN A VARIETY OF MEDIUMS:

CDC (CENTER FOR DISEASE CONTROL): BULLETINS ON COMMUNICABLE DISEASES, FILMS & LITERATURE
 PLANNED PARENTHOOD: BIRTH CONTROL LITERATURE, FILMS, SLIDE SHOWS AND EDUCATIONAL AIDES
 RED CROSS: CPR CLASSES AND LITERATURE, TRAINING FILMS
 BURN AND POISON HOTLINES: LOCAL PHONE NUMBERS AND COMMUNITY EDUCATIONAL CLASSES AND LITERATURE

THE LIST IS LONG; THE FREE-LANCE OPPORTUNITIES FOR MEDICAL ILLUSTRATORS TO DO PAMPHLETS, DESIGN EXHIBITS, POSTERS, ANNOUNCEMENTS, TRAINING MANUALS AND FILMS ARE ENORMOUS. AD AGENCIES AND AUDIO HOUSES ARE OFTEN HIGHLY PRICED, AND OUT OF REACH OF BUDGET CONSCIOUS HEALTH ORGANIZATIONS, MOST OF WHOM ARE NON-PROFIT AND RUN ON GRANTS OR VERY RESTRICTED FUNDS. IF THE FREE-LANCE ILLUSTRATOR DOES NOT HAVE THE AUDIO-VISUAL

¹U.S. DEPARTMENT OF COMMERCE, BUREAU OF THE CENSUS, STATISTICAL ABSTRACT OF THE UNITED STATES (WASHINGTON D.C.: U.S. GOVERNMENTAL PRINTING OFFICE, 1985), PP.97-9.

EQUIPMENT, HAVING THE ART WORK AND LAYOUTS FREE-LANCED AND THE AUDIO-VISUAL EQUIPMENT SUBCONTRACTED, IS STILL CHEAPER THAN HAVING A WHOLE PROJECT DONE OUT OF HOUSE.

PERIODICALS

ANOTHER GROWING MARKET FOR MEDICAL ILLUSTRATORS IS POPULAR PERIODICALS. BY POPULAR, I MEAN THOSE MAGAZINES NOT SPECIFIC TO MEDICAL FIELDS OR MEDICAL SPECIALTIES.

IN 1975 THERE WERE 9,657 PERIODICALS PUBLISHED IN THE U.S.; IN 1984, 10,809 PERIODICALS WERE AVAILABLE TO THE PUBLIC.² THAT IS AN INCREASE OF 1,152 NEW MAGAZINES OF VARIOUS SUBJECTS. POPULAR MAGAZINES, SUCH AS: READERS DIGEST, HEALTH, PARENTS, AND WORKING MOTHER, TO LIST JUST A FEW, CONTAIN MEDICAL TREATMENTS, SYMPTOMS AND REMEDIES, THAT ARE OFTEN ACCOMPANIED BY ILLUSTRATIONS AND/OR PHOTOGRAPHS. SIAMESE TWIN SEPARATIONS AND RECONSTRUCTIVE AND PLASTIC SURGERIES HAVE BEEN COVERED BY WOMEN'S MAGAZINES, IE: LADIES HOME JOURNAL, FAMILY CIRCLE AND McCALLS. MOST NOTABLY, AND PERHAPS A TREND, ARE THE "HEALTH AND FITNESS" FEATURES IN THE POPULAR WOMAN'S MAGAZINE SELF. A 1983, B.A. GRADUATE OF RIT'S MEDICAL ILLUSTRATION DEPARTMENT, MARY ELLEN THOMAS, HAS DONE PEN AND INK AND FULL COLOUR AIR-BRUSH MEDICAL ILLUSTRATIONS FOR SELF MAGAZINE. ALL THESE HEALTH FEATURES ARE ATTEMPTS AT DEMYSTIFYING MEDICINE AND SATISFYING THE PUBLIC'S CURIOSITY. THESE SERIOUS MINDED FEATURES, ALSO HELP

²IBID., P. 547.

GENERAL INTEREST PUBLICATIONS GAIN CRITICAL RESPECT.

TELEVISION

THE MOST POPULAR VEHICLE OF INFORMATION IN OUR VISUAL AND IMAGE ORIENTED SOCIETY IS TELEVISION. PROGRAMS LIKE NOVA AND CHN (CABLE HEALTH NETWORK) CONTAIN SPOTS FOR MEDICAL ILLUSTRATIONS. CRITICALLY ACCLAIMED TELEVISION SPECIALS, SUCH AS, "THE BODY HUMAN" AND "THE BRAIN" HAVE THE PROGRAM INFORMATION IN BOOK FORM AND AVAILABLE IN BOOKSTORES. THESE BOOKS AND PROGRAMS ARE VERY WELL ILLUSTRATED AND REPRESENT A GROWING MARKET. IF A T.V. SPECIAL ENJOYED POPULARITY, THE RESULTING BOOK HAS THE BENEFIT OF NATIONAL ADVERTISING.

BUSINESS

NATIONAL EXPENDITURES ON DRUGS AND SUNDRIES RUNS INTO THE BILLIONS OF DOLLARS EACH YEAR. AFTER RESEARCH AND TESTING, AND MANUFACTURING COSTS, THE LARGEST SUMS SPENT BY PHARMACEUTICAL CORPORATIONS ARE IN MARKETING AND ADVERTISING. ADS FOR MEDICINES, BOTH OVER THE COUNTER AND BY PERSCRIPTION, UTILIZE FULL COLOUR MEDICAL ILLUSTRATIONS. TELEVISION ADS, SUCH AS THE ONES CURRENTLY USED BY BUFFRIN, UTILIZE A FULL COLOUR ILLUSTRATION OF THE MUSCULATURE OF THE BODY AND ANIMATED ARROWS POINTING TO THE AREAS OF RELIEF PROVIDED BY BUFFRIN. ADS ARE REPLACED QUICKLY WITH NEW CAMPAIGN MATERIAL. FOR THIS REASON, PHARMACEUTICAL ILLUSTRATIONS REPRESENT A PLENTIFUL MARKET.

BEHIND THE PUBLIC ADVERTISING CAMPAIGNS, A WHOLE OTHER MEDICAL ILLUSTRATION USE EXISTS IN PHARMACEUTICAL COMPANIES.

I WENT TO SQUIB PHARMACEUTICAL'S WORLD HEADQUARTERS, PRINCETON, NEW JERSEY, TO TALK ABOUT THE ART NEEDS AT SQUIB. THE MANAGER OF ART SERVICES SHOWED ME THE PEN AND INK ILLUSTRATED INFORMATION SHEETS, THAT ACCOMPANY PERSCRIPTION DRUG SAMPLES FOR PHYSCIANs. THESE SHEETS ARE A SERVICE OF SQUIB, FOR DOCTORS, SO THAT THEY ARE ABLE TO PERSCRIBE THE DRUG PROPERLY.

WHEN RESEARCH AND TESTING RECEIVES APPROVAL FROM THE FDA TO RELEASE PERSCRIPTION MEDICATIONS INTO THE MARKET, SQUIB PUTS TOGETHER LITERATURE PORTFOLIOS FOR DOCTOR'S EDUCATION. THESE PORTFOLIOS CONTAIN CASSETTE TAPES AND DETAILED BOOKLETS THAT DESCRIBE SIDE EFFECTS, CAUTIONARY MEASURES AND PHYSIOLOGIC EFFECTS OF THE NEW PRODUCT. THE BOOKLETS CONTAIN TEXT, NUMERICAL DATA AND ILLUSTRATIONS. THEY ARE GRAPHICALLY EFFECTIVE PORTFOLIOS, WELL DESIGNED, THOROUGHLY PROFESSIONAL AND SERIOUS.

ALONG WITH THE NEW PRODUCT PORTFOLIOS, SQUIB IS HEAVILY INVOLVED WITH HUGE NATIONALLY HELD PRODUCT SEMINARS FOR DOCTORS. ELABORATE SLIDE SHOWS AND VIDEO-TAPES ARE CONSTRUCTED FOR THE SEMINARS. INVITATIONS GO TO SEMINAR SITES HELD ALL OVER THE U.S.; THOSE UNABLE TO ATTEND ARE SENT DETAILED VIDEO-TAPES AND PORTFOLIOS, TO BE VIEWED AT THEIR CONVENIENCE. SQUIB PICKS UP THE TAB FOR OBVIOUS REASONS. IF A DOCTOR MISPERSCRIBES A DRUG, IT IS USUALLY THE DRUG MANUFACTURER WHO GETS SUED SLONG WITH THE PHYSCIAN. IF A DRUG PROVES UNSAFE OR TOO HAZARDOUS FOR USE, THE FDA CAN PULL THE DRUG OFF THE MARKET. IN EITHER CASE, SQUIB STANDS TO LOSE A GREAT DEAL;

CAREFUL ELABORATE EDUCATIONAL CAMPAIGNS ARE A WAY TO LESSEN MISUSE OF THEIR PRODUCTS.

BESIDES PHARMACEUTICAL COMPANIES, MANUFACTURERS OF HEALTH AIDS, SUCH AS HOME PATIENT LIFTS, WHEELCHAIRS, AND PROSTHETIC DEVICES, ALSO NEED MEDICAL ARTISTS. INSTRUCTIONAL BOOKLETS ON PRODUCT USAGE ARE OFTEN ILLUSTRATED, AS ARE HEALTH AIDS ADVERTISING AND PACKAGING. AS HOSPITAL COSTS CONTINUALLY RISE, ALTERNATIVE HOME CARE AND THE EQUIPMENT NEEDED FOR REHABILITATION AND MAINTENANCE, WILL BE INCREASINGLY USED BY THE PUBLIC'S EFFORT TO LOWER COSTS AND PRESERVE PATIENT SELF-SUFFICIENCY, ESPECIALLY WITH REGARDS TO HOME CARE OF THE ELDERLY.

COMPUTER GRAPHICS

WYETH LABORATORIES IN PENNSYLVANIA, IS ANOTHER HUGE PHARMACEUTICAL CORPORATION; I SPOKE WITH THE DIRECTOR OF AUDIO-VISUAL SERVICES ABOUT THE ART NEEDS AT WYETH. WYETH HAS A THOROUGH AUDIO-VISUAL DEPARTMENT FOR THE MAKING OF IN-HOUSE LITERATURE, T.V. CLIPS, AND A GREAT DEAL OF SLIDE SHOWS. WYETH ALSO HAS A STARBURST COMPUTER GRAPHICS SYSTEM, WHICH THEY USE FOR SLIDE SHOWS, SHOWN MAINLY FOR IN-HOUSE USE. THE COMPUTER GENERATED SLIDE SHOWS CAN BE TRANSFERED TO VIDEO CASSETTE AND ARE VERY EFFECTIVE FOR TRANSMITTING INFORMATION TO A WIDE AUDIENCE AT ONE TIME. THE SLIDES AND CASSETTES ARE ALSO EASILY STORED, TAKING UP LITTLE SPACE; WYETH HAS A HUGE LIBRARY OF SLIDES AND VIDEO CASSETTES.

WYETH USES THE AVL STARBURST COMPUTER FOR GRAPHS OF STATISTICAL DATA, CHEMICAL DIAGRAMS, SCHEMATICS AND ILLUSTRATIONS. THEIR CHEMISTS AND RESEARCH DEPARTMENTS USE SLIDE SHOWS TO COMMUNICATE THEIR NEW IDEAS AND PRODUCTS, TO OTHER DEPARTMENTS AT WYETH. BY USING SLIDE SHOWS AND TAKING THEM TO EACH DEPARTMENT, WYETH SAVES TIME, INCREASES CORPORATE INTER-COMMUNICATION AND KEEPS A RECORD OF DEVELOPMENTS. I WAS ALSO TOLD THAT THE VISUAL PRESENTATIONS WERE MADE FAR MORE APPEALING AND EFFECTIVE WITH THE VARIETY ACHIEVED ON THE COMPUTER.

AUDIO-VISUAL SERVICES HAS FOUND THAT THEIR COMPUTER GRAPHICS PACKAGE HAS PAID FOR ITSELF IN THE FOLLOWING ADVANTAGES:

- EASE OF EXECUTION (NO PASTE-UPS AND MECHANICALS)
- EASE OF ERROR CORRECTION AND EDITING
- QUICK GENERATION OF CHARTS AND GRAPHS
- QUICK COMPUTER TRANSFER TO SLIDES OR VIDEO
- GOOD COLOUR AND TEXT REPRODUCTION
- ABILITY TO INCORPORATE PHOTOS INTO SLIDES BY USING THE COMPUTER

THE REASONABLE PRICE OF THE COMPUTER SYSTEM OFFERED A PRACTICAL SOLUTION TO AN OVER WORKED STAFF. WYETH STILL DOES MEDICAL ILLUSTRATION FOR PAMPHLETS, AND I WAS TOLD, WOULD REMAIN DOING SO, BUT COMPUTER GRAPHIC SYSTEMS WERE TOO COST-EFFECTIVE FOR MUCH OF THEIR WORK, FOR THEM TO EVER CONSIDER GOING BACK TO BOARD DONE ART.

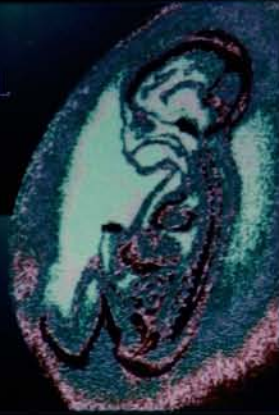
COMPUTER GENERATED T.V. CLIPS, ADVERTISING AND EDUCATIONAL FILMS, DONE OF MEDICAL AND SCIENTIFIC SUBJECTS, ARE FAST GAINING POPULARITY. THE CRITICALLY ACCLAIMED CRANSTON & CSURI OF

COLUMBUS, OHIO, HAS GAINED DISTINCTION FOR ITS COMPUTER GENERATED ANIMATION OF BIOLOGICAL AND MEDICAL SUBJECTS. THE MARKET FOR COMPUTER GENERATED ART AND ANIMATION, IS AN EVER INCREASING, POSSIBILITY FILLED, AREA FOR MEDICAL ILLUSTRATORS TO MOVE INTO.

COMPUTER GRAPHICS DO NOT REPLACE TRADITIONAL MEDICAL ILLUSTRATION, BUT RATHER ADD TO THE LIST OF MEDIUMS USED AND NEW MARKETS IN WHICH TO EXPAND. LARGE TEACHING AND RESEARCH HOSPITALS, LIKE THE CLEVELAND CLINIC AND HAHNEMANN UNIVERSITY HOSPITAL OF PHILADELPHIA, HAVE MULTI-STATIONED COMPUTER SYSTEMS TO GENERATE ART AND SLIDES. THE FACT THAT COMPUTER GENERATED MEDICAL GRAPHICS IS SUCH A YOUNG AND EXPANDING FIELD, IS PRECISELY WHY I CHOSE IT FOR MY THESIS. I EXPLORED COMPUTER IMAGES, DONE ON RIT'S ARTRONICS COMPUTER SYSTEM, THAT COULD BE USED IN POPULAR MAGAZINES, MEDICAL JOURNALS, TITLE SLIDES FOR SLIDE SHOWS, AND BOOK ILLUSTRATIONS. ALL OF THE POSSIBLE MARKETS FOR MEDICAL ILLUSTRATION SKILLS THAT I HAVE DISCUSSED, COULD HAVE THEIR WORK NEEDS DONE ON A COMPUTER.

I DESIGNED SEVEN IMAGES OF MEDICALLY ORIENTED SUBJECTS ON THE ARTRONICS COMPUTER. BELOW EACH PHOTOGRAPH OF THE COMPUTER IMAGE, I WILL DISCUSE MY REASONS FOR DESIGN, COLOUR AND SUBJECT.

RESEARCH IN
DEVELOPMENTAL
EMBRYOLOGY



RESEARCH IN DEVELOPMENTAL EMBRYOLOGY

THIS IS A COMPUTER DRAWN SAGITTAL SECTION OF AN EMBRYO AND FETUS IN SITU. THE BLUE COLOURED BACKGROUND WAS DONE TO SUGGEST DARK FLUIDS IN THE AMNIOTIC SAC. IN THE LARGER FIGURE, INCOMPLETED BRAIN DEVELOPMENT, PORTRAYED BY THE LACK OF BRAIN CONVOLUTIONS, AND NOTING ONLY MAJOR PHYSIOLOGIC SYSTEMS, CONTRIBUTE TO THE IDEA OF "DEVELOPING". THE SECOND SMALLER FIGURE IS A COMMON POSTURE OF AN EMBRYO, BEFORE REACHING THE COMPACTED FETAL POSITION OF A NEAR TERM BABY. PLACING THE TINY EMBRYO FLOATING IN THE BACKGROUND, IN RELATION TO THE MORE DEVELOPED FETUS IN THE FOREGROUND, ALSO SUGGESTS DEVELOPMENT.

I TRIED TO GET A SONOGRAM EFFECT IN THIS IMAGE, BECAUSE SONOGRAMS ARE COMMONLY UTILIZED IN STUDYING EMBRYOLOGIC DEVELOPMENT. SPOT-LIGHTING THE DARKLY SHADED BACKGROUND WAS FOR GRAPHIC EFFECT. THE WHOLE IMAGE IS ONE OF CALM, DELICATELY DIFFUSED COLOURS.

special senses

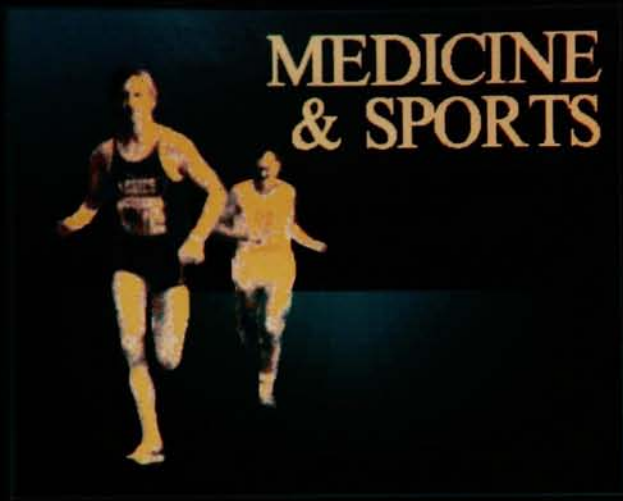
THE EYE



SPECIAL SENSES: THE EYE

SPECIAL SENSES: THE EYE WAS DESIGNED FOR USE AS A TITLE SLIDE FOR AN EDUCATIONAL SLIDE SHOW OR VIDEO. THE EYES ARE BRIGHTLY COLOURED IN ORANGES AND YELLOW, SET IN AN ULTRAMARINE BLUE BACKGROUND. THIS COLOUR COMBINATION PROJECTS WELL AND IS ATTRACTIVE.

THE TITLE SLIDE IS OFTEN THE "ATTENTION GETTER", SO I FELT I COULD BE LESS REALISTIC AND MORE GRAPHIC; LATER ILLUSTRATIONS COULD BE MORE REALISTIC. DESPITE THE "FLYING ONION" FEEL OF THE EYE BALLS, THE BASIC EYE STRUCTURES ARE ANATOMICALLY ACCURATE.

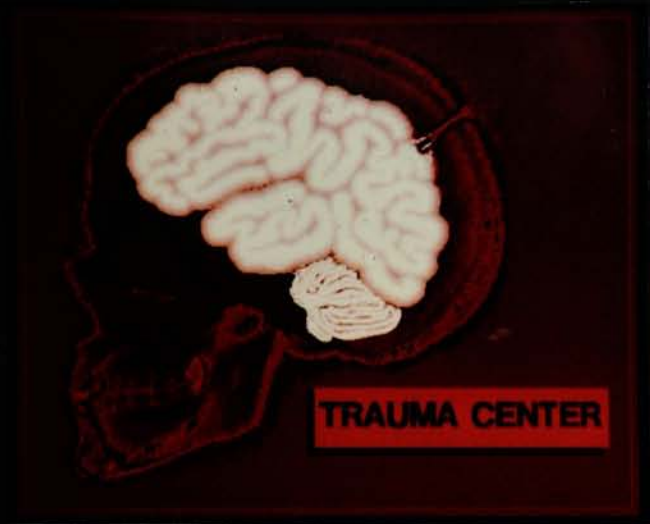


MEDICINE AND SPORTS

MEDICINE AND SPORTS IS AN IMAGE SPECIFICALLY DESIGNED FOR GENERAL INTEREST MAGAZINES OR PAMPHLETS. THIS IMAGE COULD ALSO BE USED FOR A BOOK COVER ON "SPORTS MEDICINE", WHICH HAS BECOME A SPECIALTY FIELD OF ITS OWN.

THE USE OF COMPUTERIZED SPORTS TESTING EQUIPMENT AND ENDURANCE MACHINES IN SPORTS TESTING CLINICS AND FITNESS CENTERS, COMPELLED ME TO MAKE THIS IMAGE OBVIOUSLY COMPUTER MADE. I DID NOT CLEAN UP THE PIXELS, BUT ENHANCED THE GRANULATED FEEL OF THE RUNNING FIGURES. I ALSO CHOSE A SMALL RANGE OF GRADUATED COLOURS FOR THE SHADED BACKGROUND, SO THAT THE BACKGROUND WOULD APPEAR VERY COMPUTERIZED.

MEDICINE AND SPORTS IS A SIMPLY BALANCED GRAPHIC IMAGE THAT IS MEANT TO ATTRACT ATTENTION, BUT NOT EDUCATE FOR A SPECIFIC SPORTS INJURY OR TREATMENT. THE BACKGROUND IS DARK, SO THAT THE IMAGES POP OUT. I CHOSE RUNNERS OVER OTHER SPORTS, PURELY BECAUSE OF RUNNING'S POPULARITY. MY COLOUR CHOICE IS PURELY AESTHETIC.

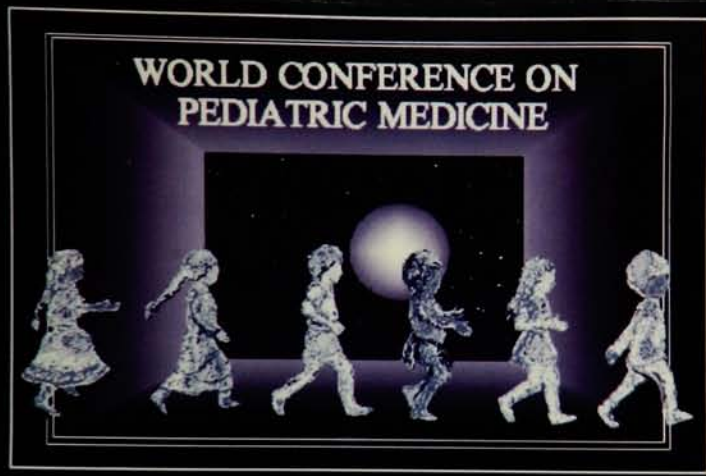


TRAUMA CENTER

TRAUMA CENTER IS A GRAPHIC PORTRAYL OF A PHENOMENA THAT KILLS MORE AMERICANS THAN ANY OTHER SINGLE CAUSE.¹ I DIDN'T WISH TO USE A FACE, THAT WOULD BE TOO SPECIFIC; SO, I CHOSE A BLACK AND ORANGE-RED SKULL, WHICH IS MORE UNIVERSAL. THE DEEP RED OF THIS IMAGE, CAPTURES VISUAL ATTENTION AND CONTRASTS WELL WITH THE DELICATE PINK OF THE VENERABLE BRAIN TISSUE. IF YOU EXAMINE THE UPPER RIGHT HAND CORNER OF THE SKULL, THERE IS AN EMBEDDED BULLET, ONE EXAMPLE OF POSSIBLE TRAUMA.

THIS IMAGE IS FLAT, SIMPLE AND I BELIEVE A GRAPHICALLY EFFECTIVE PORTRAYL OF A SERIOUS MEDICAL PHENOMENA. STATING "TRAUMA CENTER" GIVES ALL THE NECESSARY INFORMATION TO SUPPLEMENT THE IMAGE. THIS IMAGE WAS DONE WITH EXHIBIT AND PARAMEDIC TRAINING (SLIDE SHOWS) IN MIND.

¹ROBERT EGGOLD, M.D., "TRAUMA CARE REGIONALIZATION: A NECESSITY," THE JOURNAL OF TRAUMA 23 (MARCH 1983): 260--62



WORLD CONFERENCE ON PEDIATRIC MEDICINE

THIS IS AN IMAGE FOR AN EXHIBIT POSTER AND CONFERENCE TITLE SLIDE. OBVIOUSLY, PEDIATRICIANS AT A CONFERENCE ON PEDIATRIC MEDICINE ARE GOING TO BE DISCUSSING SPECIFIC ISSUES IN MEDICAL JARGON, SO I FELT SOME WARM EHIMSICAL CHILD-LIKE IMAGE COULD BE USED FOR A POSTER.

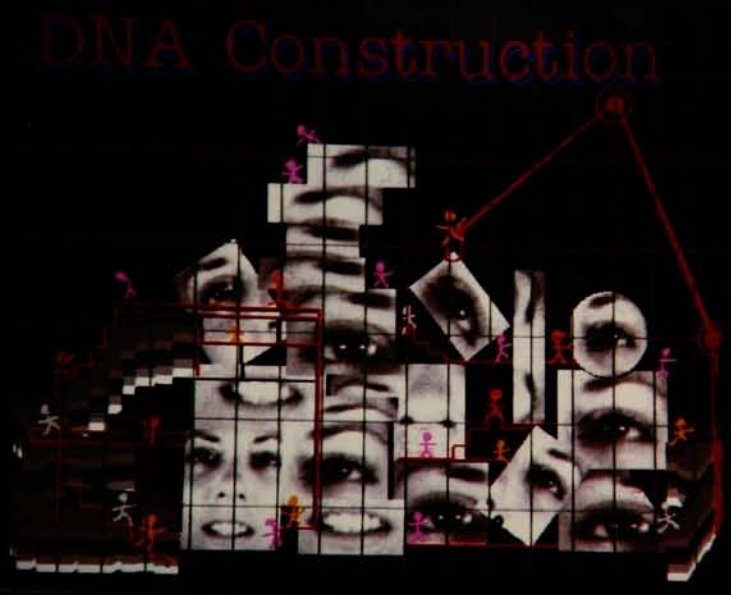
THE WORLD CONFERENCE THEME IS CARRIED THROUGH THE TRADITIONALLY DRESSED CHILDREN, ANIMATED AND MARCHING ACCROSS SPACE. THE "OUTER SPACE WINDOW" IN DARK PURPLE, WITH STARS, BRINGS THE IDEA HOME THAT ALL CHILDREN ARE PART OF A WORLD COMMUNITY, AND THAT RACE AND NATIONALITY HAVE LITTLE TO DO WITH THE WORLD'S MEDICAL COMMUNITY HELPING ALL CHILDREN TO THRIVE. THE COLOUR PURPLE WAS TRADITIONALLY RESERVED FOR ROYALTY; CHILDREN ARE THE FUTURE AND ANY NATION'S GREATEST RESOURCE.

INFECTIONS IN THE COMPROMISED PATIENT




INFECTIONS IN THE COMPROMISED PATIENT

INFECTIONS IN THE COMPROMISED PATIENT WAS THE MOST DIFFICULT OF THE IMAGES TO CONSTRUCT. THIS IMAGE IS ALSO ANIMATED AND IS INTENDED FOR USE IN VIDEO. THE BACKGROUND UNDULATES AND THE VIRUSES (GLOWING PURPLE FIGURES) RADIATE AS CYLINDRICAL LIVING ORGANISMS. THE BACKGROUND WAS CONSTRUCTED BY ARRANGING A HUGE COLOUR PALETTE, AND THEN CREATING UNEVEN AREAS THAT MATCHED AT ALL THE LIGHTS AND DARKS. THIS ENABLED ME TO GET THE UNDULATING FEEL OF RED INFLAMED, VIRALLY INFECTED CELLS. THE PURPLE TAILED VIRUSES ARE INJECTING THEIR DNA TO FORM VIRONS (INDICATED BY THE SMALLER SPHERES). THE WHOLE EFFECT IS A STYLIZED REPRODUCTION OF ONE STAGE OF INFECTION IN THE COMPROMISED PATIENT.



DNA CONSTRUCTION

THIS IS A SIMPLE FUN IMAGE FOR USE IN A CHILDREN'S SCIENCE TEXT OR MAGAZINE. THE TINY FIGURES  ARE CHILD-LIKE REPRESENTATIVES OF CHROMOSOMES. THESE CHROMOSOMES ARE USING THEIR DNA BLUEPRINTS TO BUILD A FACE; FOR FUN, I USED MY OWN FACE.

THIS TYPE OF IMAGE CAN SIMULATE THE POWER OF CHROMOSOMES AND THEIR DNA, TO BUILD SOMETHING VERY RECOGNIZABLE TO CHILDREN, A FACE, PERHAPS EVEN THEIR OWN FACE. WITH A COMPUTER, I CAN CREATE BRIGHT, WHIMSICAL FIGURES, GLOWING TYPE AND INSERT A PHOTOGRAPH OF AN OBJECT, ALL IN ONE GRAPHIC IMAGE AND DONE IN ONE MEDIUM.

USING THE ARTRONICS COMPUTER AS THE MEDIUM FOR MY THESIS, ALLOWED ME TO EXPLORE THE POTENTIAL OF MEDICAL COMPUTER GRAPHICS. FROM THE RESEARCH I DID ON MEDICAL ILLUSTRATION MARKETS, I KNOW THAT COMPUTER GENERATED MEDICAL ILLUSTRATION HAS ONLY JUST BEGUN. MY THESIS HAS GIVEN ME COMPUTER SKILLS THAT CAN ONLY ENHANCE MY ABILITY TO BE A MEDICAL ILLUSTRATOR, BECAUSE IT GIVES ME ANOTHER ARTISTIC MEDIUM AND PREPARES ME TO USE COMPUTERS WITH CONFIDENCE.

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