

THE INFLUENCE OF ENVIRONMENTAL FACTORS AND THE SOCIAL ORDER ON THE  
PRACTICE OF ANESTHESIOLOGY -

'THE MODIFICATION OF DISCOVERY BY REALITY'

CRAWFORD W. LONG MEMORIAL LECTURE

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E.M. PAPPER, M.D.

THIS OCCASION IS ONE THAT AFFORDS ME A PROFOUND SENSE OF GRATITUDE AND OF PLEASURE. I AM AWARE OF THE RESPONSIBILITY AND THE VERY GREAT PRIVILEGE OF PRESENTING THE CRAWFORD W. LONG MEMORIAL LECTURE - THE LECTURE THAT HONORS THE DISCOVERER OF ANESTHESIA. THE HIGH HONOR YOU HAVE GIVEN ME IS EMPHASIZED IN MY MIND BY THE REALIZATION THAT I MAY VERY WELL BE THE FIRST CARPETBAGGER THAT YOU HAVE INVITED AND PERMITTED TO GIVE THIS DISTINGUISHED LECTURE. I RECOGNIZE THAT IN FOUR MONTHS IT IS NOT POSSIBLE TO BE CONSIDERED A SOUTHERNER, BUT AS I LOOK AROUND THE ROOM I AM COMFORTED BY THE FACT THAT OTHER IMMIGRANTS INTO THIS PART OF THE COUNTRY SEEM TO HAVE BEEN ABSORBED WITHOUT TOO MUCH DIFFICULTY, INCLUDING YOUR OWN DISTINGUISHED DEPARTMENTAL CHAIRMAN IN ANESTHESIOLOGY.

THOSE OF YOU IN THIS AUDIENCE WHO READ OR LISTEN TO ANNUAL LECTURES, WILL UNDOUBTEDLY HAVE NOTICED THAT THEY OFTEN CAN BE CLASSIFIED INTO THREE LARGE GROUPS. THERE ARE THOSE WHICH PAY HOMAGE TO OUR MEDICAL ANCESTORS FROM ARISTOTLE TO ZINSSER: THOSE WHICH INTRODUCE A NEW SCIENTIFIC CONCEPT, OR REVIEW THE PARTICULAR INVESTIGATIVE OR CLINICAL EXPERIENCE OF THE SPEAKER; AND FINALLY, THOSE WHICH MAY BE CATEGORIZED AS LITERARY DISCOURSES ON PHILOSOPHICAL SUBJECTS. I DON'T KNOW HOW THIS LECTURE CAN BE CLASSIFIED. AT ITS CONCLUSION, SOME OF YOU WILL DECIDE IT WAS A MIXED STEW, OTHERS WILL THINK IT IS NOT TRUE; AND SOME WILL REALIZE THAT THEY KNEW IT ALL THE TIME; AND OTHERS WILL UNDOUBTEDLY FEEL THAT SOMETHING MORE PRACTICAL SHOULD HAVE BEEN DONE, AND FINALLY, OTHERS WILL FEEL THAT SOMETHING LESS PRACTICAL SHOULD HAVE BEEN DONE. DESPITE THESE RISKS, I SHALL TAKE THE CHANCE.

IN THE EARLY PART OF THE NINETEENTH CENTURY, THERE WAS MUCH DISCUSSION AND MUCH SPECULATION ABOUT THE ABILITY TO PRODUCE A PAINLESS STATE BY A VARIETY OF METHODS FOR THE PERFORMING OF THEN- LIMITED NUMBER OF SURGICAL PROCEDURES. WHEN CRAWFORD W. LONG, A NEW AND YOUNG GRADUATE IN MEDICINE, BEGAN HIS GENERAL PRACTICE IN THE SMALL TOWN OF JEFFERSON IN THE STATE OF GEORGIA IN 1840, THE DEMONSTRATION THAT THE INHALATION OF CERTAIN SUBSTANCES COULD BE USED FOR ENTERTAINMENT BECAUSE OF THEIR BIZARRE EFFECTS ON THE SUBJECTS WAS CLEARLY IN THE AIR. LONG WAS SAID TO BE A VERY LIKEABLE YOUNG MAN AND HIS OFFICE SOON BECAME A COLLECTION PLACE WHERE THE BRIGHT, YOUNG PEOPLE OF JEFFERSON MET IN AN EVENING AND DISCUSSED CURRENT TOPICS.

LONG HIMSELF READ A PAPER BEFORE THE GEORGIA STATE MEDICAL SOCIETY IN 1852 WHICH I QUOTE.

"IN THE MONTH OF DECEMBER, 1841, OR IN JANUARY, 1842, THE SUBJECT OF THE INHALATION OF NITROUS OXIDE GAS WAS INTRODUCED IN THE COMPANY OF YOUNG MEN ASSEMBLED AT NIGHT IN THE VILLAGE OF JEFFERSON, GEORGIA, AND THE PARTY REQUESTED ME TO PREPARE THEM SOME. I INFORMED THEM I HAD NOT THE REQUISITE APPARATUS FOR PREPARING OR PRESERVING THE GAS, BUT THAT I HAD AN ARTICLE (SULFURIC ETHER) WHICH WOULD PRODUCE EQUALLY EXHILARATING EFFECTS AND WAS AS SAFE. THE COMPANY WERE ANXIOUS TO WITNESS ITS EFFECTS, THE ETHER WERE INTRODUCED AND ALL PRESENT IN TURN INHALED. THEY WERE SO PLEASED WITH ITS EFFECTS THAT THEY AFTERWARD FREQUENTLY USED IT AND INDUCED OTHERS TO DO THE SAME, AND THE PRACTICE SOON BECAME QUITE FASHIONABLE IN THE COUNTY AND SOME OF THE CONTIGUOUS COUNTIES.

ON NUMEROUS OCCASIONS I INHALED ETHER FOR ITS EXHILARATING PROPERTIES AND WOULD FREQUENTLY, AT SOME SHORT TIME, SUBSEQUENT TO ITS INHALATION, DISCOVER BRUISED OR PAINFUL SPOTS ON MY PERSON, WHICH I HAD NO RECOLLECTION OF CAUSING AND WHICH I FELT

SATISFIED WERE RECEIVED WHILE UNDER THE INFLUENCE OF ETHER. I NOTICED MY FRIENDS, WHILE ETHERIZED, RECEIVED FALLS AND BLOWS, WHICH I BELIEVED WERE SUFFICIENT TO PRODUCE PAIN ON A PERSON NOT IN A STATE OF ANESTHESIA, AND ON QUESTIONING THEM THEY UNIFORMLY ASSURED ME THAT THEY DID NOT FEEL THE LEAST PAIN FROM THESE ACCIDENTS. OBSERVING THESE FACTS I WAS LED TO BELIEVE THAT ANESTHESIA WAS PRODUCED BY THE INHALATION OF ETHER, AND THAT ITS USE WOULD BE APPLICABLE IN SURGICAL OPERATIONS."

THE MARVELOUS DEMONSTRATION OF THE USE OF ETHER FOR SURGICAL ANESTHESIA ON MARCH 30TH, 1842 IS A PART OF HISTORY. THE OPERATION ON THE YOUNG MAN, MR. JAMES VENABLE, DURING ETHERIZATION, IS NOW ONE OF THE CLASSICS OF THE HISTORY OF MEDICINE.

CRAWFORD LONG MADE A MOST INTERESTING STATEMENT, WHICH CONTRIBUTES IN PART TO THE ARGUMENT ABOUT THE DISCOVERY OF ANESTHESIA. HE STATES, "THE REASONS WHICH INFLUENCED ME IN NOT PUBLISHING EARLIER ARE AS FOLLOWS: I WAS ANXIOUS BEFORE MAKING ANY PUBLICATION TO TRY ETHERIZATION IN A SUFFICIENT NUMBER OF CASES TO FULLY SATISFY MY MIND THAT ANESTHESIA WAS PRODUCED BY THE ETHER, AND WAS NOT THE EFFECT OF THE IMAGINATION OR OWING TO ANY PECULIAR INSUSCEPTIBILITY TO PAIN IN THE PERSONS EXPERIMENTED ON.

AT THE TIME I WAS EXPERIMENTING WITH ETHER, THERE WERE PHYSICIANS HIGH IN AUTHORITY.....WHO WERE ADVOCATES OF MESMERISM AND RECOMMENDED THE INDUCTION OF THE MESMERIC STATE AS ADEQUATE TO PREVENT PAIN IN SURGICAL OPERATIONS. NOT WITHSTANDING THIS SANCTIONED, I WAS AN UNBELIEVER IN THE SCIENCE AND OF THE OPINION THAT IF THE MESMERIC STATE COULD BE PRODUCED AT ALL, IT WAS ONLY ON THOSE OF STRONG IMAGINATIONS AND WEAK MINDS...ENTERTAINING THIS OPINION, I WAS THE MORE PARTICULAR IN MY EXPERIMENTS ON ETHERIZATION.

WHILE I WAS CAUTIOUSLY EXPERIMENTING WITH ETHER, AS CASES OCCURRED.... OTHERS MORE FAVORABLY SITUATED ENGAGED IN SIMILAR EXPERIMENTS AND CONSEQUENTLY THE PUBLICATION OF ETHERIZATION DID NOT BIDE MY TIME."

WHAT A MAGNIFICENT LESSON IN THE PROBLEMS OF DISCOVERY AND RECOGNITION THEREOF!

THE RISK AND EVIDENCE, THAT, DESPITE THESE STATEMENTS OF DR. LONG HIMSELF, THERE APPEARS TO HAVE BEEN CONSIDERABLE AMOUNT OF PREJUDICE PROBABLY DUE TO IGNORANCE OF THE POPULATION IN HIS SURROUNDING AREA. HIS DAUGHTER, MRS. FRANCES LONG TAYLOR, SUGGESTED THAT DR. LONG MAY HAVE BEEN PREVENTED FROM USING ETHER IN OTHER CASES BECAUSE "HE WAS CONSIDERED RECKLESS, PERHAPS MAD. IT RUMORED THROUGHOUT THE COUNTRY THAT HE HAD A STRANGE MEDICINE BY WHICH HE COULD PUT PEOPLE TO SLEEP AND CARVE THEM TO PIECES WITHOUT THEIR KNOWLEDGE. HIS FRIENDS PLEADED WITH HIM TO ABANDON ITS USE AS IN THE CASE OF A FATALITY HE WOULD BE MOBBED OR ----- LYNCHED."

LONG HIMSELF, DOES NOT APPEAR TO HAVE BEEN AFFECTED BY THESE FORCES AND THERE ARE THOSE WHO CONSIDER THAT HIS DAUGHTER'S REASON FOR DESCRIBING IN SO DRAMATIC TERMS THE PROBLEMS THAT HE FACED, MAY HAVE DONE SO IN AN UNDERSTANDABLE BUT MISTAKEN EFFORT TO PRESERVE THE CREDIT FOR THE DISCOVERY OF ETHERIZATION FOR HER FATHER, IN VIEW OF THE WIDE-SPREAD PUBLICITY GIVEN TO THE DEMONSTRATION OF THE USE OF ETHER BY MORTON IN THAT MODEST SIZED COMMUNITY IN THE NORTH - THE ATHENS OF AMERICA - THE HUB OF THE UNIVERSE - BOSTON, MA.

IT IS NOW TIME FOR US TO TURN OUR ATTENTION TO THOSE FASCINATING FACTORS OFTEN UNSPOKEN, USUALLY UNWRITTEN, WHICH HAVE AN IMPORTANT AND OFTEN COMPELLING INFLUENCE UPON THE PRACTICE OF CLINICAL ANESTHESIA THAT DO NOT, OF NECESSITY, DERIVE DIRECTLY FROM CLINICAL EXPERIENCE AND ARE USUALLY

INDIRECTLY DERIVED FROM THE SCIENTIFIC HABIT OF THOUGHT. I SHALL REVIEW SOME OF THESE CONSIDERATIONS TO EXAMINE THE NATURE OF THEIR IMPACT ON THE PRACTICE OF CLINICAL ANESTHESIA AND THE IMPACT THEY MAY HAVE HAD UPON RESEARCH.

LEST I BE MISUNDERSTOOD, I WILL NOT APPEAL TO YOU TO CONSIDER DESIRABLE OR EVEN UNDESIRABLE THE MANY FACTORS OFTEN UNCONSCIOUS, WHICH CONTRIBUTE TO THE WAY WE CARE FOR PATIENTS AND THE WAY WE DO RESEARCH IN ANESTHESIA. ON THE CONTRARY, MY DISCUSSION WILL EMPHASIZE THE NEED TO BRING THESE FACTORS INTO CRITICAL EXAMINATION AND CONTROL SO THAT WE MAY UTILIZE THESE FASCINATING FORCES TO PROVIDE BETTER CARE FOR PATIENTS AND IMPROVE KNOWLEDGE IN THE FIELD OF ANESTHESIOLOGY. THE NEED TO EMPHASIZE THE INTELLECTUALITY OF THE CONTROL FORCES IN CLINICAL PRACTICE, WERE SUMMARIZED MAGNIFICENTLY BY ALFRED NORTH WHITEHEAD, THE GREAT PHILOSOPHER IN THE EARLY PART OF THIS CENTURY. HE SAID "IN THE CONDITIONS OF MODERN LIFE THE RULE IS ABSOLUTE; THE RACE WHICH DOES NOT VALUE TRAINED INTELLIGENCE IS DOOMED. NOT ALL OF YOUR HEROISM, NOT ALL YOUR SOCIAL CHARM, NOT ALL OF YOUR WIT, CAN MOVE BACK THE FINGER OF FATE. TODAY WE MUST MAINTAIN OURSELVES. TOMORROW SCIENCE WILL HAVE MOVED FORWARD YET ONE MORE STEP, AND THERE WILL BE NO APPEAL FROM THE JUDGMENT WHICH WILL BE PRONOUNCED ON THE UNEDUCATED." THIS IS A HARSH JUDGMENT, BUT IT IS AN ACCURATE ONE. WE HAVE NO ROOM TO COMPROMISE WITH ANYTHING BUT THE HIGHEST STANDARDS IN LOOKING AT THESE AND OTHER FACTORS.

ONE OF THE IMPORTANT FACTORS IN PRESENT-DAY LIFE IS THE INFLUENCE OF MAN ON THE ENVIRONMENT AND IN THE WAY HE POLLUTES IT. THERE IS REVENGE FOR THESE ENVIRONMENTAL DISTORTIONS BY NATURE. LET US EXAMINE THE ROLE OF THE ENVIRONMENT UPON THE PRACTICE OF ANESTHESIA. WE CAN CONSIDER ONLY A FEW OF THESE PROBLEMS TODAY. THERE IS THE SIMPLE FACT THAT AMBIENT

TEMPERATURE VARIES IN DIFFERENT COUNTRIES, AND WITH THE SEASONS IN THE SAME COUNTRY. IT WAS BELIEVED FOR MANY YEARS BEFORE THE USE OF AIR CONDITIONING THAT ANESTHESIA IN THE TROPICS COULD NOT INCLUDE INHALATION AGENTS BECAUSE ONLY OPEN METHODS OF ADMINISTRATION WERE AVAILABLE. IT IS DIFFICULT TO CONDUCT ANESTHESIA SMOOTHLY AND SAFELY USING OPEN METHODS BECAUSE OF THE HIGH AMBIENT TEMPERATURES AND THE HIGH RELATIVE HUMIDITY. UNDER THESE CIRCUMSTANCES, THE DEVELOPMENT OF REGIONAL ANESTHESIA WAS SPURRED AND ADVOCATED AS THE METHOD OF CHOICE. ONE SOLUTION OF THE PROBLEM OF HIGHER TEMPERATURES APPEARED IN THE DESIGN OF NEW AND EFFECTIVE VAPORIZERS. GENERAL ANESTHESIA CAN NOW BE USED IN MANY HOT CLIMATES BECAUSE OF THE CHANGE IN EQUIPMENT ACTUALLY PLANNED FOR A COMPLETELY DIFFERENT PURPOSE. SEVERAL VAPORIZERS ARE CURRENTLY AVAILABLE WHICH COMPENSATE FOR CHANGES IN AMBIENT TEMPERATURE AND WITHIN REASONABLE LIMITS MAINTAIN VAPOR CONCENTRATION IN THE EFFLUENT MIXTURE AT THE PROPER CLINICAL LEVEL. AN IMPORTANT PRODUCT OF THIS CONCEPT WAS DEVELOPED AT THE UNIVERSITY OF WISCONSIN BY DR. LUCIEN MORRIS. THOSE VAPORIZERS THAT DEPEND ON THE TRANSMISSION OF HEAT AND DO NOT COMPENSATE FOR TEMPERATURE CHANGES, ALSO FUNCTION ADEQUATELY IF THE VAPOR PRESSURE AND THE TEMPERATURE OF THE LIQUID ANESTHETIC ARE BOTH KNOWN. IN THIS MANNER, A WHOLE NEW METHOD OF APPROACH TO ANESTHETIC PRACTICES IN MANY PARTS OF THE WORLD IN THE FUTURE MAY BE CONDITIONED NOT BY THE TOTALITY OF CLINICAL AND SCIENTIFIC FACTS ALONE, BUT MORE BY THE LIMITATIONS OR LACK OF LIMITATIONS OF METHODS OF ADMINISTERING GENERAL ANESTHESIA. WHO CAN TELL WHETHER THE NATURE OF CLINICAL ANESTHESIA IN THE NEW AFRICAN NATIONS AND THEREFORE SOME ASPECTS OF THE HEALTH OF THESE NATIONS WILL BE DETERMINED MORE BY VAPORIZER DESIGN AND THE AVAILABILITY OF COMPRESSED GASES THAN BY CLINICAL OR SCIENTIFIC PAPERS IN THE JOURNALS OF WESTERN NATIONS?

AIR CONDITIONING IN OPERATING THEATERS HAS BECOME ALMOST UNIVERSAL IN THE UNITED STATES TO PROVIDE AN EVEN ENVIRONMENT IN CLIMATES THAT ARE OFTEN SEVERE IN WINTER AND ALSO IN SUMMER. FOR REASONS ASSOCIATED WITH BACTERIOLOGICAL CONTROL, SOME OF THE PLANS FOR AIR CONDITIONING ARE GOING TO PROVE A SOCIOLOGICAL DELIGHT. THE DEBATE AS TO WHETHER TROUSERS OR SKIRTS ARE BETTER FOR OUR FEMALE COLLEAGUES IN NURSING AND IN MEDICINE, BACTERIOLOGICALLY SPEAKING THAT IS, MAY HAVE SOME INTERESTING AND FASCINATING COLLATERAL AFFECTS IN THE VERY NEAR FUTURE. THE MINI SKIRT OR THE MULTI-TROUSERS MAY BE THE RESULT OF THESE INDIRECT FACTORS.

THE MAN-MADE CHANGE IN ENVIRONMENT HAS HAD A MARKED INFLUENCE ON THE CONDUCT OF ANESTHESIA IN THAT IT IS NOW POSSIBLE TO ARRANGE ANESTHETIC PRACTICES WHICH CAN IGNORE VARIATIONS IN HUMIDITY. THIS HAS A BEARING ON THE EXPLOSION PROBLEM. ODDLY ENOUGH, AS HUMIDITY SEEMS TO HAVE BEEN BETTER CONTROLLED, EXPLOSIVE ANESTHETIC AGENTS HAVE BEEN DECREASINGLY USED. THE REASONS FOR THESE PUZZLING AND PARADOXICAL CHANGES WOULD BE INTERESTING TO EXAMINE, BUT TIME DOES NOT PERMIT OUR ENTRY INTO THIS FIELD AT THIS TIME.

IN MY EARLIEST EXPERIENCE IN ANESTHESIA, THE CLINICAL PROBLEM OF ETHER CONVULSIONS BEST DESCRIBED FROM THE UNIVERSITY OF WISCONSIN, LATER SHOWN TO BE DUE, AMONG OTHER THINGS, TO HEAT LOADING IN OPERATING THEATERS, HAS BEEN TOTALLY ELIMINATED SIMPLY BY THIS CHANGE OF THE ENVIRONMENT. IT IS A PROBLEM I FEEL QUITE CERTAIN VERY FEW OF YOU IN THIS AUDIENCES HAVE ENCOUNTERED AND PERHAPS ARE EVEN UNAWARE OF ITS EXISTENCE. NOW THE INSTITUTION OF AIR CONDITIONING HAS, OF COURSE, CREATED A NEW SET OF PROBLEMS, PARTICULARLY FOR THE NEWBORN AND THE YOUNG INFANT. THE CONTROL OF BODY TEMPERATURE IN THESE YOUNG PATIENTS IS LESS EFFECTIVE THAN IN OLDER CHILDREN OR ADULTS AND ONE FINDS

A MUCH GREATER TENDENCY FOR FALLS IN BODY TEMPERATURE IN AIR CONDITIONED ENVIRONMENTS. THE HYPOTHERMIA PRODUCED IN THESE YOUNG PATIENTS HAS A TENDENCY TO DEPRESS OR ARREST RESPIRATION AND TO RETARD THE RATE OF DRUG METABOLISM, FOR EXAMPLE, DEMEROL, AND ALSO TO FACILITATE THE PENETRATION OF DRUGS THROUGH THE BLOOD BRAIN BARRIER. FOR THESE REASONS, THE HYPOTHERMIA PRODUCED BY AIR CONDITIONING COULD CONCEIVABLY ENHANCE THE NET EFFECT OF POWERFUL DRUGS IN A WAY THAT WAS NOT ANTICIPATED BY THE AIR CONDITIONERS WHO SET UP ENVIRONMENTAL CONTROLS.

CHANGES IN ATMOSPHERIC PRESSURE ALSO HAVE AN IMPACT UPON CERTAIN ASPECTS OF ANESTHETIC PRACTICE. AT HIGH ALTITUDES, EVEN IN AREAS OF FIVE TO SEVEN THOUSAND FEET, WHERE SYMPTOMS WOULD NOT ORDINARILY OCCUR IN HEALTHY PATIENTS, THE ATMOSPHERIC PRESSURE IS LOW ENOUGH (APPROXIMATELY 550 MILLIMETERS OF MERCURY) TO CAUSE AN INCREASE IN HEMOGLOBIN CONCENTRATION IN PERMANENT RESIDENTS IN THESE AREAS. UNDER THESE CONDITIONS, ANESTHETIC AGENTS LIKE NITROUS OXIDE AND ETHYLENE BECOME MORE DIFFICULT TO USE WITHOUT HYPOXIA THAN THEY ARE AT SEA LEVEL. THE PROBLEMS OF ADMINISTERING ANESTHESIA UNDER HYPERBARIC CONDITIONS SEEMS TO BE LESS PRESSING AT THE PRESENT TIME IN VIEW OF THE RELATIVELY LOW LEVEL OF POPULARITY OF HYPERBARIC CHAMBERS IN WHICH ANESTHETICS MUST BE ADMINISTERED, BUT THE PROBLEMS OF THE MANAGEMENT OF THESE ANESTHETICS REQUIRE AN EXTENSIVE KNOWLEDGE OF THEIR PHARMACOKINETICS.

ANOTHER ASPECT OF THE ENVIRONMENT WHICH DESERVES OUR CONSIDERTION IS THE INHALED ATMOSPHERE FOR ALL PEOPLE IN AN OPERATING ROOM, INCLUDING SURGEONS, NURSES, ANESTHESIOLOGISTS AND OTHER PEOPLE IN ATTENDANCE. AN ENVIRONMENT WHICH PERMITS THE DISCHARGE OF SMALL CONCENTRATIONS OF ANESTHETIC SUBSTANCES INTO THE ROOM BECAUSE OF THE WAY IN WHICH SEMI-CLOSED METHODS ARE SO OFTEN USED MAY POSE POSSIBLE HEALTH HAZARDS.

TO THE BEST OF MY KNOWLEDGE, THERE ARE NO GOOD EPIDEMIOLOGICAL STUDIES, NOR GOOD QUANTITATIVE STUDIES OF THE INFLUENCE OF THESE SUBSTANCES ON THOSE WHO WORK IN THIS KIND OF ENVIRONMENT. IT IS PROBABLE THAT THE PROBLEM IS NOT ONE OF SERIOUS MAGNITUDE - EXCEPT FOR THE PROVEN AND UNEXPLAINED HIGHER INCIDENTS OF TWIN BIRTHS IN FAMILIES OF ANESTHESIOLOGISTS! HOWEVER, SUCH STUDIES ARE DESERVING OF BEING DONE AND IT IS HOPED BY MANY OF US THAT THERE WILL BE SOME EFFORT IN THIS DIRECTION TO FIND OUT WHETHER THERE ARE ORGAN OR OTHER KINDS OF DAMAGE FROM CHRONIC EXPOSURE TO VERY LOW CONCENTRATIONS OF ANESTHETIC SUBSTANCES. THERE ARE FASCINATING CASE REPORTS OF ALLERGY TO HALOTHANE (CITE PLOTKIN) AND THERE MAY BE OTHER PROBLEMS, I.E. INCREASED INCIDENCE OF LYMPHATIC SYSTEM DISORDER, WHICH CLOSER STUDY WILL REVEAL.

THE ECONOMIC STATUS OF A COMMUNITY AND ITS POLITICAL ORGANIZATION HAS A MUCH GREATER EFFECT UPON THE PRACTICE OF MEDICINE, INCLUDING THE PRACTICE OF ANESTHESIA THAN IS USUALLY APPRECIATED. IN COUNTRIES WHERE INDUSTRY AND TECHNOLOGICAL DEVELOPMENT ARE WELL-ADVANCED, EQUIPMENT AND MEDICINE ARE FREELY AVAILABLE AS A RULE. IN UNDERDEVELOPED COUNTRIES, ANESTHETIC EQUIPMENT, AS WELL AS OTHER MEDICAL INSTRUMENTS AND DRUGS, MUST BE IMPORTED AT HIGH COST, OR ARE NOT AVAILABLE. THE NET RESULT IN THE UNDERDEVELOPED COUNTRY IS A MARKED SCARCITY AND THE UNAVAILABILITY OF ESSENTIAL ITEMS FOR ANESTHETIC PRACTICE.

BECAUSE OF ECONOMIC FACTORS, REGIONAL ANESTHESIA MAY BECOME INCREASINGLY POPULAR. A NEEDLE, SYRINGE AND A LOCAL ANESTHETIC DRUG ARE OFTEN MORE AVAILABLE AND LESS EXPENSIVE THAN OTHER METHODS OF GIVING ANESTHESIA. THESE APPARENT SIMPLICITIES DO NOT TAKE INTO ACCOUNT THE VAST PHYSIOLOGICAL DERANGEMENTS SUCH METHODS CAN AND DO PRODUCE IN WHICH RESUSCITATION APPROACHES ARE ALARMINGLY SIMILAR TO THE KINDS OF APPARATUS AND KNOWLEDGE IN

SHORT SUPPLY THAT IS REQUIRED FOR THE GIVING OF GENERAL ANESTHESIA. INTRAVENOUS GENERAL ANESTHETICS ARE USED IN CERTAIN PARTS OF THE WORLD, ESPECIALLY LATIN AMERICA, USING BARBITURATES, ANALGESICS, MUSCLE RELAXANTS AND LOCAL ANESTHETICS, WITHOUT THE USE OF COMPRESSED GASES, DUE TO THE EXPENSE OF OBTAINING SUCH GAS PREPARATIONS. CLEARLY THE STAGE OF TECHNOLOGICAL AND ECONOMIC DEVELOPMENT OF A NATION INFLUENCES ITS METHODS OF GIVING ANESTHETICS, APART FROM CLINICAL KNOWLEDGE AND SCIENTIFIC FACT.

ODDLY ENOUGH, THE OVER-ABUNDANCE OF TECHNOLOGICAL ADVANCE IS OFTEN NOT TRANSLATED INTO THE PRECISE AND PROPER CARE OF PATIENTS.

FOR INSTANCE, THE TECHNOLOGICAL KNOWLEDGE OF RESPIRATION AND ESPECIALLY OF THE CAPABILITY OF MONITORING IMPORTANT AND VITAL FUNCTIONS OF THE BODY, WHICH WERE DEVELOPED IN CONNECTION WITH THE SPACE PROGRAM, HAVE BEEN TRANSLATED INTO CLINICAL ANESTHETIC CARE ALMOST NOT AT ALL AS YET. ONE WONDERS WHY A GROUP OF YOUNG, VIGOROUS PEOPLE IN ANESTHESIOLOGY HAVE NOT SEIZED THE GREATER OPPORTUNITIES WHICH HAVE BEEN AFFORDED TO THEM BY THESE TECHNOLOGICAL ADVANCES. ONE SHOULD NOT CRITICIZE ANESTHESIOLOGY AS A SPECIALTY SOLELY BECAUSE OTHER INDIVIDUALS IN OTHER FIELDS HAVE BEEN EQUALLY NON-ENERGETIC IN SEIZING THIS INFORMATION FOR THEIR OWN USE. IT IS OBVIOUS THAT MUCH MORE EFFORT IN THIS DIRECTION MUST BE PROSECUTED AND WITH VIGOR. THE EFFECTIVE INTERACTION OF MAN AND MACHINE IN ANESTHETIC CARE STILL IS IN THE FUTURE, BUT HOPEFULLY, NOT IN THE FAR FUTURE.

THE ECONOMIC STATUS OF A COUNTRY INFLUENCES THE SUPPLY OF ALL MEDICAL PERSONNEL AND THE AVAILABILITY OF ANESTHESIOLOGISTS IN PARTICULAR. IN COUNTRIES LIKE THE UNITED STATES, WHICH ARE SO HEAVILY ORIENTED TOWARD THE PRIVATE PRACTICE OF MEDICINE, THE ELEMENTS THAT ATTRACT INDIVIDUALS INTO THIS SPECIALTY OFTEN HAVE

ONLY AN INCIDENTAL RELATIONSHIP TO THE MEDICAL NEEDS OF THE ENTIRE COUNTRY AND MAY BE GOVERNED LARGELY BY ECONOMIC AND OTHER SOCIAL OPPORTUNITIES AND CONSIDERATIONS.

IN THOSE COUNTRIES WHERE MEDICINE IS MORE CENTRALLY ORGANIZED, AND WHERE THE ANESTHESIOLOGIST ALSO ENJOYS THE STATUS OF COMPLETE PROFESSIONAL AND FINANCIAL EQUALITY WITH OTHER SPECIALISTS, PHYSICIANS ARE ATTRACTED INTO THIS SPECIALTY FOR COMPLETELY DIFFERENT REASONS FROM OUR OWN. THE KIND OF PHYSICIAN WHO ENTERS A SPECIALTY AS WELL AS HIS INTERESTS, WILL, ODDLY ENOUGH, HAVE A MARKED INFLUENCE ON THE KIND OF ANESTHETIC METHODS AND PRACTICES HE CHOOSES FOR THE CLINICAL CARE OF HIS PATIENTS. THE ENTIRE QUESTION OF NURSE AND TECHNICIAN ANESTHESIA IN THESE UNITED STATES AND IN MANY PARTS OF THE WORLD IS CONDITIONED TO A VERY LARGE DEGREE BY THIS KIND OF ISSUE AND IS NOT, BY ANY MEANS, A MATTER OF INTELLECTUAL OR OTHER CONVICTION. IT IS NOT A SIMPLE MATTER TO DISCUSS IN DETAIL, BUT THE MAIN POINT TO MAKE IS THAT THE KIND OF PEOPLE AVAILABLE FOR A GIVEN FORM OF PRACTICE WILL HAVE A MARKED INFLUENCE ON THE KIND OF ANESTHESIA THAT IS ADMINISTERED. THOSE COUNTRIES WHICH HAVE A SUBSTANTIAL AMOUNT OF NURSE ANESTHESIA ALSO HAVE A TENDENCY TOWARD REPETITIVE TYPES OF MANAGEMENT OF ANESTHESIA, WHICH IN MY JUDGMENT IS PERFECTLY REASONABLE AND APPROPRIATE, BUT IT NONETHELESS DOES CHANGE THE WAY ANESTHETICS ARE GIVEN. PHYSICIANS WHO TEND TO BE CREATURES OF ROUTINE, ALSO SLIP COMFORTABLY INTO STAID HABITS WHICH ARE ALMOST UNSHAKEABLE BY THE FORCES OF REASON AND THE AVAILABILITY OF NEW KNOWLEDGE AND EXPERIENCE. THE INFLUENCE THIS FORCE HAS ON THE WAY IN WHICH ANESTHESIA IS GIVEN MUST BE ENORMOUS AND IT HAS LITTLE TO DO WITH THE RATIONAL AND SCIENTIFIC BASIS OF ANESTHETIC PRACTICE. IT IS A DEVELOPMENT THAT PRECEDES FROM LARGE RELEVANT SOCIAL AND ECONOMIC FORCES; NOT BY MEDICAL OR SCIENTIFIC FACTORS.

AS WE PURSUE THESE SOCIO-ECONOMIC FACTORS FURTHER, THE STANDARD OF LIVING OF A PEOPLE BECOMES A FACTOR OF CONSIDERABLE IMPORTANCE IN ITS INFLUENCE ON ANESTHETIC PRACTICE. IN AFFLUENT SOCIETIES, PATIENTS TEND TO BE MORE ACCUSTOMED TO PHYSICAL COMFORT AND MORE DEMANDING OF EMOTIONAL AND MENTAL COMFORT AS WELL. IN SURGICAL PATIENTS, THE CONSIDERATION OF COMFORT OFTEN MAY BECOME AN OVER-RIDING FACTOR IN THE CHOICE OF ANESTHESIA AND MAY IN FACT AT TIMES BE IN CONFLICT WITH THE PROPER ELEMENTS OF SAFETY. THIS PROBLEM BECOMES EVEN MORE IMPORTANT AS IT BECOMES INVOLVED WITH SITUATIONS WHERE LEGAL ACTION IS QUICKLY TAKEN FOR FANCIED AS WELL AS ACTUAL INJURIES CAUSED BY DOCTORS DURING THE TREATMENT OF PATIENTS, INCLUDING THE ADMINISTRATION OF ANESTHESIA. IN OUR COUNTRY, HEALTHY PATIENTS ACCUSTOMED TO MANY OF THE COMFORTS OF LIVING, OFTEN BECOME QUITE DEMANDING OF SERVICE FROM ALL MEMBERS OF THE PROFESSION, INCLUDING THE ANESTHESIOLOGIST. IN THIS PARTICULAR RELATIONSHIP, MAY LIE THE BASIS FOR CERTAIN HABITS IN THE PRACTICE OF ANESTHESIA AND FOR THE USE OF PARTICULAR DRUGS AND ANESTHETIC METHODS. ONE WOULD BE HARD PUT OTHERWISE TO EXPLAIN THE SUBSTANTIAL EFFORTS TO CONTROL CLINICAL SYMPTOMS OFTEN TRIVIAL BY THE ROUTINE USE OF TRANQUILIZERS FOR PRE-ANESTHETIC MEDICATION, ANTIEMETICS FOR POST-OPERATIVE EMESIS AND NAUSEA, AND FOR THE USE OF THOSE ANESTHETIC AGENTS AND METHODS WHICH WILL PROVIDE THE MOST COMPLETE OBLITERATION OF THE STATE OF CONSCIOUSNESS AND AWARENESS BEFORE, DURING AND AFTER THE SURGICAL EXPERIENCE. IN SHORT, LARGE DOSES OF PRE-ANESTHETIC DRUGS, LARGE DOSES OF INDUCING AGENTS, AND HEAVY SEDATION IN THE POST-OPERATIVE PERIOD ARE MORE FREQUENTLY EMPLOYED THAN IS DESIRABLE BECAUSE OF APPARENTLY UNRELATED SOCIO-ECONOMIC FACTORS. IT IS HIGHLY LIKELY THAT THESE DISTORTIONS HAVE A SERIOUS IMPACT, NOT ONLY ON ANESTHETIC PRACTICE PER SE, BUT ON THE COMPLICATIONS WHICH

PATIENTS MUST INEVITABLY SUFFER. ALTHOUGH I AM NOT WELL-INFORMED ON THE QUESTION, IT IS CONCEIVABLY THAT IN A SOCIETY IN WHICH MEDICAL CARE IS COMMUNITY CONTROLLED, SIMILAR PROBLEMS MAY ARISE. THE PATIENT, AS A CONSUMER, MAY FEEL THAT HE HAS "CERTAIN ANESTHETIC RIGHTS" SINCE HE OWNS HIS MEDICAL CARE IN COMMON WITH OTHER MEMBERS OF THE COMMUNITY. IT WILL BE INTERESTING TO SEE WHETHER AS MEDICAL CARE BECOMES MORE AND MORE A PART OF THE RIGHTS OF ALL PEOPLE, WHETHER THIS PATTERN IN FACT DOES UNFOLD.

IN THOSE SOCIETIES WHERE THE CONTROL OF PRACTICE IS COMPLETE, ONE MAY LEARN CERTAIN LESSONS OF POSSIBLE IMPACT ON THE PRACTICE OF ANESTHESIA, SHOULD THE AMERICAN SCENE CHANGE MORE COMPLETELY IN THIS DIRECTION. IT IS EASY FOR ME TO BE CONVINCED THAT AS SOCIAL CONTROL TIGHTENS, THERE WILL BE AN INCREASED CONVICTION THAT THE PRESERVATION OF NORMAL HEALTH, I.E.; PUBLIC HEALTH PRACTICES, COMMUNITY MEDICINE, NUTRITION AND THE LIKE WILL RECEIVE ENHANCED PRIORITIES TO THE DISADVANTAGE OF THOSE FIELDS IN MEDICINE WHICH ARE MORE ORIENTED TOWARD THE RESTORATION OF HEALTH RATHER THAN THE PREVENTION OF DISEASE. ANESTHESIA COULD SUFFER IN SUCH A DEVELOPMENT AND SO COULD ALL OF THE SPECIALTIES THAT ARE DESIGNED TO TAKE ACTIVE INTERVENTION IN THE RESTORATION OF HEALTH FROM A DISEASED STATE. ACTIVE PARTICIPATION IN PUBLIC AFFAIRS BY ALL OF US IS NECESSARY TO PREVENT THIS KIND OF DISTORTION FROM DEVELOPING IN OUR SOCIETY AND YET TO ENCOURAGE THE GREATER IMPORTANCE OF HEALTH MAINTENANCE.

OTHER SOCIAL FORCES ARE BEGINNING TO BE MORE AND MORE APPRECIATED. THE DEBATE BETWEEN DR. JOHN BUNKER AND DR. FRANCIS D. MOORE, CONCERNING THE USE OF SURGERY ALMOST AS A SOCIAL PRACTICE IS A FASCINATING ONE. BUNKER MAKES THE POINT THAT THERE IS MUCH TOO MUCH SURGERY DONE IN THE UNITED STATES AS

COMPARED TO THE UNITED KINGDOM. IT IS THIS TYPE OF ACTIVITY, INCLUDING THE LONG AND MORE LEISURELY PACE OF AMERICAN SURGERY THAT, IN HIS JUDGMENT, HAS GIVEN RISE TO A SHORTAGE OF ANESTHESIOLOGISTS AND THEREFORE, A DIFFERENCE IN THE PATTERN OF ANESTHETIC CARE AND PRACTICE. IN POINT OF FACT, IT IS INTERESTING TO DISSECT THE IMPLICATIONS OF THESE STATEMENTS AND DR. MOORE'S REBUTTAL THAT MORE SURGICAL CARE IS NECESSARY FOR A HEALTHIER COMMUNITY IN THE UNITED STATES. THE SAME NUMBER, PROPORTIONATELY TO POPULATION, OF ANESTHESIOLOGISTS EXISTS IN THE UNITED KINGDOM AND THE UNITED STATES. THERE ARE, AS YET, NO NURSES OR OTHER TECHNICIANS PRACTICING ANESTHESIA IN THE UNITED KINGDOM AND NURSE ANESTHESIA IS A MOST IMPORTANT PART OF THE PRACTICE OF THE SPECIALTY IN THIS COUNTRY. COULD THE DIFFERENCE IN ATTITUDES TOWARDS THE INDICATIONS FOR SURGERY BE A SIMPLE AND DIRECT EXPLANATION OF A MARKED AND VERY IMPORTANT DIFFERENCE IN THE PRACTICE OF ANESTHESIA?

ANOTHER INFLUENCE OF IMPORTANCE OF THE ATTITUDE OF THE CONSUMER TOWARDS ANESTHESIA LIES IN THE SYSTEMATIC MYTHOLOGY WHICH ALL FIELDS OF MEDICINE SEEM TO DEVELOP. WOE BE UNTO THE PHYSICIAN WHO DOES NOT TAKE THESE MYTHS INTO CONSIDERATION; THE USE OF SPINAL ANESTHESIA IS A CASE IN POINT. IT IS A FACT THAT PARALYSIS AND SPINAL ANESTHESIA DOES OCCUR, BUT IT IS OBVIOUSLY RARE. IN A MAGNIFICENTLY CONDUCTED STUDY, THE INCIDENCE OF PARALYSIS WAS CLEARLY VERY LOW AND THE BENEFITS FROM SPINAL ANESTHESIA GREAT. THIS STUDY OF VAN DAM AND DRIPPS, IN 1960 AT THE UNIVERSITY OF PENNSYLVANIA IS A CLASSIC OF ITS KIND. NEVERTHELESS, DESPITE THE SMALL AND NEGLIGIBLE INCIDENCE OF DAMAGE FROM SPINAL ANESTHESIA, MOST ANESTHESIOLOGISTS HAVE ABANDONED THIS METHOD BECAUSE OF THE FEAR OF LAW SUIT. THE PRACTICE OF MEDICINE, IN THIS INSTANCE, WAS AFFECTED, NOT SO MUCH BY INTELLECTUAL AND CLINICAL CONCERNS WITH THE METHOD, BUT

BY A PUBLICLY-HELD ATTITUDE, LARGELY A MYTH. THE NEGATIVE INFLUENCE OF SOCIETY ON THE PRACTICE OF ANESTHESIA HAS OTHER IMPORTANT ASPECTS. THERE ARE WAXING AND WANING ATTITUDES ABOUT HALOTHANE AS A CAUSE OF LIVER DAMAGE, AND ABOUT METHOXYFLURANE AS A CAUSE OF HIGH OUTPUT RENAL FAILURE. DESPITE THE VAST AMOUNT OF MATERIAL ACCUMULATED ON THIS SUBJECT, THERE IS A NOTEWORTHY ATTITUDE ON THE PART OF SOME PATIENTS AND THEIR DOCTORS THAT THEY DO NOT WANT AN ANESTHETIC THAT DESTROYS THEIR LIVER OR THEIR KIDNEYS. FORTUNATELY THIS ATTITUDE HAS NEVER GAINED AS WIDE CREDIBILITY AS HAS THE SPINAL ANESTHESIA MYTH, BUT IS A FACTOR OF NO SMALL CONSEQUENCE INFLUENCING PRACTICES. ANESTHETICS ALWAYS CARRY RISK. IT IS NECESSARY TO WEIGH THE RISK AGAINST THE BENEFITS AND THIS IS A MATTER OF MEDICAL JUDGEMENT. DR. WATERS USED TO TEACH THAT IF ONE BRINGS TWO PATIENTS TO THE O.R. AND GIVES THEM NOTHING BUT A GLASS OF WATER AT LEAST ONE WILL HAVE A COMPLICATION.

ANOTHER IMPORTANT ELEMENT IN THE CHOICE AND PRACTICE OF ANESTHESIA IS THE DIFFERING INTERPRETATION IN THE LIGHT OF INCOMPLETE KNOWLEDGE THAT MOST OF US ATTRIBUTE TO ILLNESSES WHICH CHANGE THE PHYSICAL CONDITION OF THE PATIENT. FOR EXAMPLE, THE PRESENCE OF SEVERE PULMONARY EMPHYSEMA IN A PATIENT WITH ALL THE RESPIRATORY DIFFICULTY THAT IS ENTAILED, WILL INDICATE TO SOME ANESTHESIOLOGISTS THAT INHALATION ANESTHESIA GIVES HIM THE BEST OPPORTUNITY OF CLEANSING THE PATIENT'S AIRWAY AND LUNGS OF ACCUMULATED SECRETIONS AND MATERIAL AND GIVES HIM THE GREATEST CONTROL OVER VENTILATION. HE WILL TEND TO SELECT A NON-POTENT GAS, WHICH EQUILIBRATES QUICKLY IN THE BODY. FOR HIM, RESPIRATOR TREATMENT IN THE POSTOPERATIVE PERIOD IS ESSENTIAL. TO ANOTHER EQUALLY COMPETENT ANESTHESIOLOGIST, EMPHYSEMA MEANS THAT THE PATIENT MUST NOT HAVE AN ADDED BURDEN ON HIS RESPIRATORY FUNCTION AND THAT HE MUST HAVE REGIONAL

ANESTHESIA IF THIS IS AT ALL POSSIBLE, AND ALLOW NATURE TO TAKE CARE OF THE PROBLEM OF EMPHYSEMA. IT IS OBVIOUS THAT THIS IS THE KIND OF AREA WHERE DIFFERENCE OF OPINION COULD BE RESOLVED MORE READILY BY FINER PRECISION IN RESEARCH, BOTH ON A BASIC AND ON A CLINICAL LEVEL.

THE NATURE OF OPERATION ITSELF HAS A VERY IMPORTANT GOVERNING FORCE ON THE PRACTICE OF ANESTHESIA. SURGEONS IN THE UNITED STATES AND IN EUROPE HAVE CONSIDERABLE DIFFERENCES OF OPINION ON HOW CERTAIN TECHNICAL PROCEDURES SHOULD BE ACCOMPLISHED. IN GENERAL, SURGEONS IN THE UNITED STATES TEND TO OPERATE MORE METICULOUSLY WITH RESPECT TO HEMOSTASIS AND REQUIRE A LONGER PERIOD OF TIME THAN THEIR EUROPEAN COUNTERPARTS.

THIS PARTICULAR DIFFERENCE IS LESS MARKED IN COMPARING THE HABITS OF AMERICAN SURGEONS IN COMMUNITY HOSPITAL PRACTICE WITH EUROPEAN COUNTERPARTS. THIS IS NOT THE PLACE TO ARGUE THE MERITS OR DEMERITS OF THE PARTICULAR HABITS OF OUR SURGICAL COLLEAGUES, BUT IT IS A POINT TO EMPHASIZE, THAT ANESTHETIC PRACTICES ARE MARKEDLY LIMITED OR AT THE VERY BEST, GOVERNED BY THE KIND OF SURGICAL PACING AND TECHNOLOGY THAT THE ANESTHESIOLOGIST HAS TO WORK WITH. FOR INSTANCE, THE ANESTHESIOLOGIST WHO MUST PROVIDE ADEQUATE TO EXCELLENT ABDOMINAL MUSCLE RELAXATION FOR AN ABDOMINAL OPERATION REQUIRING FIVE HOURS OF EXPERT SURGERY, HAS A TOTALLY DIFFERENT PROBLEM WITH RESPECT TO ANESTHETIC DRUGS, ANESTHETIC TECHNIQUES, THE PRESERVATION OF BODY WATER AND BODY ELECTROLYTES, THAN DOES THE ANESTHESIOLOGIST WHO IS DEALING WITH, ON THE FACE OF IT, A SIMILAR SURGICAL PROBLEM THAT REQUIRES ONLY ONE AND A HALF HOURS OF OPERATING. THESE DIFFERENCES OF CIRCUMSTANCES HAVE ACCOUNTED FOR A BEDEVILMENT OF THE ANESTHETIC LITERATURE IN WHICH CERTAIN APPROACHES TO ANESTHESIA IN OUR COUNTRY APPEAR TO BE RIDICULOUS BEYOND DESCRIPTION TO OUR BRITISH COLLEAGUES, AND THEIR

APPROACHES TO ANESTHESIA FOR APPARENTLY SIMILAR PROBLEMS ARE KNOWN TO BE GROSSLY INADEQUATE TO US. WE SHOULD RESOLVE THESE PROBLEMS BY RECOGNIZING THAT EVEN THOUGH THE NAME OF THE OPERATION IS THE SAME, THE NAME OF THE GAME IS TOTALLY DIFFERENT. OTHER SURGICAL PRACTICES, SUCH AS THE USE OR LACK OF USE OF THE ELECTROCAUTERY FOR DISSECTION AND HEMOSTASIS HAVE AN OBVIOUS IMPACT ON THE KIND OF ANESTHESIA THAT MAY BE USED.

I SHOULD LIKE TO TURN MY ATTENTION TO SOME ANALYSIS OF THE TEMPERAMENT, THE CHARACTER AND THE INTELLECTUAL ACHIEVEMENT OF THE ANESTHESIOLOGIST, INsofar AS IT INFLUENCES HIS ANESTHETIC PRACTICE. THE BUSY CLINICIAN, WHO SPENDS ALL OF HIS LIFE IN THE TECHNICAL ADMINISTRATION OF ANESTHETIC AGENTS IN AN OPERATING ROOM, AND WHO PARTICIPATES LITTLE IN THE PRE- AND POST-OPERATIVE CARE OF PATIENTS, INEVITABLY WILL HAVE A DECLINE IN HIS INTEREST AND COMPETENCE IN THOSE SCIENTIFIC PROBLEMS WHICH ARE VESTED IN THE LARGER ASPECTS OF HIS SPECIALTY. HE WILL TEND TO DEVELOP A STEREOTYPED OUTLOOK ON CLINICAL ANESTHESIA AND WILL DEVELOP A PROFESSIONAL LIFE, WHICH IS MARKED BY LACK OF ADVENTURE AND LACK OF CHANGE IN HIS PRACTICE.

THERE ARE MANY OTHERS AND THEY ARE BECOMING A LARGE MAJORITY, TO WHOM THE FULL AND COMPLETE PRACTICE OF ANESTHESIA IS A WORTHY AND DIGNIFIED ACTIVITY AND THAT A PHYSICIAN WHO PRACTICES IT MUST AVOID THOSE DANGERS OF DIVORCING HIMSELF FROM THE ADVANCING FRONT OF NEW SCIENTIFIC KNOWLEDGE AND FROM INTIMATE CONTACT WITH PATIENTS, THEIR DISEASES AND PROBLEMS. HE WILL IF HE IS STIMULATED, KEEP ABREAST OF NEW KNOWLEDGE, AND WILL FIND THAT HE BECOMES LESS RESISTANT TO CHANGE AND LESS COMFORTABLE IN A STEREOTYPED PRACTICE. HIS METHODS WILL BECOME MORE RATIONAL AND HIS METHODS OF ADMINISTRATION OF ANESTHESIA MORE CONSISTENT WITH THE PROGRESS OF SCIENTIFIC KNOWLEDGE. HE WILL HAVE CONTINUAL PLEASURE IN THE CARE OF THE ANESTHETIZED

PATIENT. HE WILL EVEN BE ABLE TO CONTRIBUTE TO THE EDUCATION OF OTHERS - A KIND OF PROFESSIONAL IMMORTALITY.

FINALLY, IN SHORT RECAPITULATION, IT IS THE THESIS OF THIS LECTURE, THAT A LARGE NUMBER OF FACTORS, ONLY SOME OF WHICH HAVE BEEN CONSIDERED, HAVE AN INFLUENCE UPON THE CLINICAL PRACTICE OF ANESTHESIA. THESE FACTORS ARE NOT NECESSARILY BASED ON SCIENTIFIC KNOWLEDGE OR EVEN CLINICAL EXPERIENCE. THEY ARE ASSOCIATED WITH HUMAN DISCOVERY IN THE PRE-DISCOVERY PERIOD!! ATTENTION HAS BEEN GIVEN TO SOME OF THOSE ELEMENTS IN DETERMINING ANESTHETIC PRACTICE WHICH ARE NOT OFTEN DISCUSSED OR CONSIDERED. MANY COMPETENT CLINICAL ANESTHESIOLOGISTS ARE UNAWARE OF THEIR FORCE AND OFTEN WILL DENY THEIR INFLUENCE ON THE PRACTICE OF ANESTHESIA. THE EVIDENCE SEEMS CLEAR THAT THESE FACTORS -- SOME CULTURAL, SOME SCIENTIFIC, SOME PSYCHOLOGICAL, SOME SOCIOLOGICAL -- ALL HAVE TO VARYING DEGREES, AN IMPORTANT BEARING ON HOW ANESTHETICS ARE ADMINISTERED TO SURGICAL PATIENTS. MANY FACTORS ARE SUSCEPTIBLE OF MODIFICATION BY EDUCATION AND SOCIO-ECONOMIC CHANGE. THE ANESTHESIOLOGIST MUST EXAMINE THESE INFLUENCES ON HIS OWN PROFESSIONAL LIFE AND WORK TO CHANGE THOSE ELEMENTS WHICH RETARD THE GROWTH OF HIS OWN KNOWLEDGE OF HIS OWN SPECIALTY, WHICH RETARD THE BEST CARE OF PATIENTS AND OBSTRUCT THE DEVELOPMENT OF SCIENTIFIC RESEARCH AND VIGOR IN EDUCATION. IT IS APPROPRIATE TO CONCLUDE WITH FRANCIS BACON'S WORDS OF WISDOM; HE BELIEVED THAT KNOWLEDGE SHOULD BE DEVELOPED FOR THE BENEFIT AND USE OF MAN, THAT IT SHOULD "NOT BE AS A COURTESAN FOR PLEASURE AND VANITY ONLY, OR AS A BOND-WOMAN TO ACQUIRE AND GAIN TO HER MASTER'S USE; BUT AS A SPOUSE FOR GENERATION, FRUIT AND COMFORT."