

LECTURE FOR UNIVERSITY OF HEIDELBERG

**THE INFLUENCE OF GERMAN UNIVERSITIES & GERMAN MEDICAL SCIENCE
ON AMERICAN UNIVERSITIES & AMERICAN MEDICINE**

(1870 - 1914)

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ANESTHESIOLOGY**

PROFESSOR JUST, HONORED COLLEAGUES AND GUESTS. IT IS A GREAT PLEASURE AND AN HONOR FOR ME TO BE PRIVILEGED TO TALK TO YOU ON THIS HAPPY OCCASION OF THE CELEBRATION OF THE **600TH ANNIVERSARY** OF THE DISTINGUISHED **UNIVERSITY OF HEIDELBERG**.

OUR COMMUNITY OF ACADEMIC ANESTHESIOLOGISTS IN THE UNITED STATES HAVE GIVEN ME THE PLEASANT DUTY OF BRINGING YOU THEIR FELICITATIONS AND GREETINGS ON THIS WONDERFUL OCCASION.

I HAVE CHOSEN, FOR THESE REMARKS, TO COMMENT ON THE MAJOR INFLUENCE OF THE GERMAN-SPEAKING UNIVERSITIES ON AMERICAN MEDICAL SCIENCE AND CLINICAL PRACTICE DURING THE MOST IMPORTANT AND INTERESTING PERIOD BETWEEN THE ESTABLISHMENT OF THE GERMAN EMPIRE IN 1871 AND THE CATAclysm OF THE ONSET OF THE FIRST WORLD WAR IN 1914.

THE PERIOD FROM 1870 OR MORE PRECISELY 1871 FROM THE TIME OF THE ESTABLISHMENT OF THE GERMAN EMPIRE TO THE ONSET OF THE FIRST WORLD WAR IN 1914 WAS AN EXTRAORDINARY TIME WHEN THE DEVELOPMENT OF AMERICAN MEDICAL SCIENCE AND AMERICAN CLINICAL PRACTICE WAS STRONGLY INFLUENCED BY THE UNIVERSITIES IN THE GERMAN SPEAKING WORLD. THIS WAS AN UNPRECEDENTED TIME OF TRANSMISSION OF THE CULTURE OF SCIENCE AND

OF CLINICAL PRACTICE FROM THE GERMAN SPEAKING UNIVERSITIES TO THE THEN YOUNG AND EVOLVING UNITED STATES OF AMERICA. IT WAS A CLASSIC PERIOD ILLUSTRATING THE GLORIOUS INTERNATIONAL NATURE OF SCIENCE IN ITS BEST SENSE.

THE GERMAN UNIVERSITIES AND GERMAN MEDICAL SCIENCE WERE OUTSTANDING IN THE WORLD. THERE WAS A TREMENDOUS FERMENT OF DEVELOPMENT OF ALL OF THE FUNDAMENTAL SCIENCES BASIC TO BIOLOGY AND MEDICINE AS WELL AS THE PROVISION OF OUTSTANDING CLINICAL CARE FOR THE PEOPLES OF GERMANY, SWITZERLAND, AND THE AUSTRO-HUNGARIAN EMPIRE. FOREIGNERS FROM ALL COUNTRIES WERE WELCOMED INTO THE GERMAN UNIVERSITIES FOR STUDIES BOTH IN CLINICAL PRACTICE AND IN SCIENCE. FOR INSTANCE, AT THE UNIVERSITY OF HEIDELBERG ALONE, WHOSE ANNIVERSARY WE CELEBRATE THIS YEAR, THERE WERE SERBS, AUSTRIANS, AMERICANS, AND RUSSIANS AMONG THE FOREIGNERS IN THE MEDICAL COURSES JUST PRIOR TO THE OUTBREAK OF THE FIRST WORLD WAR WHEN SHORTLY THEREAFTER THEY WOULD, FIGURATIVELY AND LITERALLY, BE AT EACH OTHERS' THROATS.

THE AMERICANS AND THE RUSSIANS WERE THE MOST NUMEROUS AND EAGER OF THE FOREIGN STUDENTS AT THAT TIME IN HEIDELBERG. THERE WAS AN UNUSUAL COINCIDENCE IN THAT THE FATHER OF MODERN MEDICAL SCIENCE IN BOTH RUSSIA, PROFESSOR IVAN PAVLOV AND IN THE UNITED STATES OF AMERICA, PROFESSOR WILLIAM H. WELCH WERE STUDENTS AT THE SAME TIME IN LEIPZIG BETWEEN 1885 AND 1888 IN THE LABORATORIES OF ONE OF THE GREATEST OF ALL GERMAN SCIENTISTS, PROFESSOR KARL LUDWIG.

IT IS AN OBVIOUS AND REASONABLE QUESTION TO ASK WHY AMERICANS CHOSE AT THAT PARTICULAR TIME TO GO TO THE GERMAN UNIVERSITIES FOR THEIR STUDIES.

POST-GRADUATE EDUCATION IN ALL OF THE CLINICAL SPECIALTIES IN GERMANY WAS AT AN EXTRAORDINARILY HIGH LEVEL OF DEVELOPMENT.

MEDICAL SCIENCE WAS ALMOST EXCLUSIVELY A GERMAN PREROGATIVE, ALTHOUGH THERE WERE CENTERS OF EXCELLENCE IN OTHER PARTS OF EUROPE INCLUDING THE UNITED KINGDOM AND FRANCE.

COINCIDENT WITH THE EXTRAORDINARY DEVELOPMENT OF CLINICAL PRACTICE AND EDUCATION WAS A VERY HIGH LEVEL OF RESEARCH ACCOMPLISHMENT IN GERMANY THAT DID NOT EXIST AT THAT TIME IN THE UNITED STATES OF AMERICA EVEN REMOTELY COMPARABLE TO THE ACHIEVEMENTS IN GERMAN UNIVERSITIES. AS A MATTER OF FACT, MEDICAL EDUCATION IN THE UNITED STATES THEN WAS HIGHLY CHAOTIC. IT WAS OFTEN COMMERCIAL AND ORGANIZED MOSTLY FOR THE PRODUCTION OF PRACTITIONERS WHO HAD NOT ONLY NO BACKGROUND IN SCIENCE BUT VERY LITTLE EXPERIENCE IN CLINICAL MEDICINE.

AMERICANS HAD, OF COURSE, GONE ABROAD TO STUDY PRIOR TO THE PERIOD WHEN THEY WENT TO GERMANY IN SUCH LARGE NUMBERS BECAUSE OF THE UNDERDEVELOPED NATURE OF A COLONIAL SOCIETY UNDER BRITISH CONTROL WHICH ACHIEVED INDEPENDENCE FROM BRITAIN TOWARD THE END OF THE 18TH CENTURY. DURING THE COLONIAL PERIOD OF AMERICAN DEVELOPMENT AND FOR THAT MATTER WELL INTO ITS EARLY YEARS OF INDEPENDENCE AMERICANS WHO WISHED TO STUDY MEDICINE OFTEN WENT, TO PARIS AND VERY LARGELY TO GREAT BRITAIN ESPECIALLY TO SCOTLAND FOR THEIR EDUCATION AS WELL AS THEIR POST-GRADUATE TRAINING. THIS PATTERN OF GOING ABROAD FOR MEDICAL EDUCATION CONTINUED INTO THE 19TH CENTURY BUT CHANGED FROM THE UNITED KINGDOM TO THE GERMAN SPEAKING UNIVERSITIES. THE AMERICAN MEDICAL SCHOOLS WERE CHARACTERIZED BY OBSERVERS OF THE SCENE AT THAT TIME AS LARGELY AS TRADE SCHOOLS WITH THE EXCEPTION OF A SMALL NUMBER ON THE EASTERN COAST OF THE UNITED STATES LIKE HARVARD, YALE, AND COLUMBIA THAT HAD ACHIEVED MODEST PROGRESS TOWARD THE INTELLECTUAL AND CULTURAL ASPECTS OF UNIVERSITY EDUCATION ASSOCIATED WITH MEDICINE. IN THE MAIN

THEREFORE, THE AMERICAN SCENE WAS AN UNDESIRABLE ONE IN MANY RESPECTS. IT, PARENTHETICALLY FOR THIS AUDIENCE, GIVES ONE PAUSE IN THINKING TO REALIZE THAT ONE OF THE GREATEST OF AMERICAN DISCOVERIES IN MEDICINE, NAMELY THE DISCOVERY OF ANESTHESIA, OCCURED AT A TIME AND IN A SOCIETY IN WHICH THERE WAS INTELLECTUAL FERMENT THROUGHOUT THE WESTERN WORLD BUT A PAUCITY OF EXCELLENCE IN ANY SENSE OF THE WORD IN MEDICAL SCIENTIFIC COMPETENCE. THE AMERICAN DISCOVERY OF ANESTHESIA SPREAD THOUGH THE WESTERN WORLD VERY QUICKLY BUT FOR A PERIOD OF NEARLY 80 YEARS, VERY LITTLE THAT WAS IMPORTANT IN STUDYING ITS SCIENTIFIC BASIS OR ITS INTELLECTUAL ORIGINS WAS DONE. THERE WERE SOME SIGNIFICANT STUDIES IN THE UNITED KINGDOM WHICH WERE OF IMPORTANCE, AND OCCASIONAL EFFORTS OF THIS KIND IN GERMANY. A FURTHER EXAMPLE WAS THE DEVELOPMENT OF SPINAL ANESTHESIA. AN AMERICAN CLINICIAN FIRST INJECTED COCAINE INTO THE SUBARACHNOID SPACE BUT A GERMAN SCIENTIST MADE THE NECESSARY DIFFICULT ELABORATE AND DETAILED STUDY OF THE METHOD REQUIRED FOR THE BEGINNINGS OF RATIONAL UNDERSTANDING.

OF COURSE THERE WERE EXCEPTIONS TO THE GENERAL STATEMENT OF THE STATUS OF AMERICAN MEDICINE AT THIS TIME IN THAT AMERICANS WERE LEADERS IN ANESTHESIOLOGY, DENTISTRY, AND OPTOMETRY. MILITARY MEDICINE HAD ALSO GREATLY EXCELLED IN THE UNITED STATES INCLUDING MATTERS LIKE PUBLIC SANITATION AND SURGERY FOR TRAUMA AS A RESULT OF THE GRAVE DISASTER OF THE AMERICAN CIVIL WAR WHICH PROBABLY, IN PROPORTION TO THE SIZE OF THE POPULATIONS, WAS THE GREATEST TRAGEDY OF DEATH AND DESTRUCTION UNTIL WORLD WAR I OCCURRED.

IT IS NECESSARY TO DESCRIBE ACCURATELY THE ENORMOUS GERMAN INFLUENCE ON WORLD MEDICINE, INCLUDING AMERICAN MEDICINE. MANY THINKERS IN THIS FIELD BELIEVE THAT THE MODERN SCIENTIFIC ERA OF MEDICAL SCIENCE BEGAN WITH THE DISCOVERY BY ROBERT KOCH IN 1882 OF

THE TUBERCLE BACILLUS WHICH PROFOUNDLY CHANGED BACTERIOLOGY AND THE CONCEPT OF DISEASE FOR ALL TIME. IN MY VIEW CHANGE WAS MORE SUBTLE AND MORE GRADUAL AND WAS MUCH WIDER IN SCOPE THAN THE IMPORTANT SINGLE DISCOVERY OF ONE OF THE GREATEST SCIENTISTS OF ALL TIME.

ONE MUST LOOK TO THE GERMAN UNIVERSITY FOR PROVIDING AN UNPRECEDENTED ATTRACTION FOR FOREIGNERS ESPECIALLY AMERICANS AND ALSO RUSSIANS DURING THE PERIOD THAT WE ARE CONSIDERING. SOME OF THE GREATEST NAMES IN MEDICAL SCIENCE WERE SIMULTANEOUSLY ACTIVE IN ALMOST ALL OF THE GERMAN UNIVERSITIES IN THE GERMAN EMPIRE, THE AUSTRO-HUNGARIAN EMPIRE AND IN SWITZERLAND. THEY WERE OUTSTANDING TEACHERS AS WELL. THERE WERE FABULOUS RESOURCES ALSO AVAILABLE IN THESE UNIVERSITIES. PROFESSORS LIKE LUDWIG, KOCH, AND BRUCKE WERE VERY HOSPITABLE TO AMERICAN STUDENTS. THE ENORMOUSLY SUCCESSFUL LARGE HOSPITALS IN CITIES LIKE VIENNA AND BERLIN WERE MAGNETS OF ATTRACTION FOR AMERICANS LOOKING FOR ADVANCED CLINICAL EDUCATION. THERE WAS FREEDOM OF TEACHING AND FREEDOM OF LEARNING IN THE GERMAN UNIVERSITIES THAT WAS NOT CHARACTERISTIC OF THE METHODS OF TEACHING AND LEARNING IN THE UNITED STATES AT THAT TIME. THE IDEA THAT A SERIOUS STUDENT COULD ELECT COURSES THAT HE WISHED OR COULD WORK WITH GREAT SCIENTISTS AND CLINICIANS THAT HE RESPECTED WAS NOT KNOWN IN THE UNITED STATES. THIS WAS A FANTASTIC ATTRACTION TO AMERICANS WHO WISHED TO STUDY ABROAD. FOR INSTANCE, THE FAMOUS HARVARD SURGEON ASSOCIATED WITH THE INTRODUCTION OF ANESTHESIA, HENRY BIGELOW WROTE IN 1871 ABOUT THE ATTRACTION OF GERMAN EDUCATION THAT "A MEDICAL SCHOOL VIRTUALLY APPOINTED AND CARRIED BY MEDICAL MEN, - A TEACHING BASE MAINLY UPON LARGE CLINICAL OPPORTUNITY AND ABUNDANT AND ACCURATE DEMONSTRATION OF MEDICAL FACTS, - A SYSTEM OF GUARANTEEING TO THE SOUNDEST TEACHER, THE

WIDEST REPUTATION, AND THE LARGEST CLASSES, WITH AN UNRESTRICTED FREEDOM OF COMPETITION ESPECIALLY IN THE OUTSET, AND HOLDING OUT AS ITS FINAL PRIZE, A PERMANENT TENURE OF ITS HIGHEST OFFICES WITH AN ADEQUATE REMUNERATION, - SUCH ARE THE ELEMENTS OF THE GREAT SUCCESS OF MODERN GERMAN MEDICAL EDUCATION."

SOME EXAMPLES OF THE SITUATION AS IT WAS VIEWED BY AMERICANS MIGHT BE OF INTEREST TO DESCRIBE. AT THE UNIVERSITY OF HEIDELBERG IN 1870, THERE WERE 33 AMERICAN STUDENTS AND 40 IN 1874. THE FUTURE LEADERS OF AMERICAN MEDICAL SCIENCE AND THE GREAT ESTABLISHERS OF ITS CONCEPT IN THE UNITED STATES LIKE WILLIAM HENRY WELCH, FOUND THE GERMAN LABORATORY, ITS SERIOUS ATMOSPHERE, ITS EXCITEMENT OF DISCOVERY, ITS DISCIPLINE, IN THE SPIRIT OF SCIENCE TO BE MOST ATTRACTIVE. THE DISTINGUISHED GREAT AMERICAN EMBYOLOGIST, FRANKLIN MALL, FOUND THE FREEDOM TO STUDY AND WORK WITH GREAT TEACHERS TO BE AN ENORMOUS ATTRACTION - ALSO UNKNOWN IN THE UNITED STATES.

THERE WERE LARGE CLINICAL FACILITES FOR THOSE INTERESTED IN CLINICAL MEDICINE AND OF COURSE, THERE WERE THOSE AMERICANS TYPICAL OF ANY PEOPLE AT ANY TIME, WHO ENJOYED THE FUN, THE EXCITEMENT OF EUROPEAN CULTURE INCLUDING ITS BEER HALLS, ITS WINE CELLARS, ITS MUSIC, AND ITS APPARENTLY ETERNAL LIGHT-HEARTEDNESS A GREAT ATTRACTION. THERE WERE MANY AMERICANS WHOSE STUDIES IN THE GERMAN SPEAKING UNIVERSITIES WERE FAR FROM SERIOUS BUT SOMETHING GOOD APPARENTLY RUBBED OFF ON THEM AFTER THEIR RETURN TO THE UNITED STATES. THERE ARE WRITINGS OF THAT PERIOD THAT SUGGEST THAT GERMAN STUDENTS WERE NO DIFFERENT FROM AMERICANS IN THEIR INTEREST IN FRIVOLITY AS WELL AS SERIOUS STUDY AND WORK.

THERE MAY BE SOME SPECULATION ON THE PART, BOTH OF AMERICANS AND GERMANS TODAY AS TO THE GREAT EMPHASIS PLACED ON THE VIEWS OF AMERICANS STUDYING IN GERMANY ON THE FREEDOM OF THOUGHT AND THE

FREEDOM OF MOBILITY THAT THEY FOUND SO COMFORTABLE IN THE GERMAN UNIVERSITY BETWEEN THE PERIODS OF 1870 AND 1914. MODERN AMERICANS TEND TO THINK OF THE GERMAN PROFESSORIAL SYSTEM AS BEING QUITE RIGID AND ARISTOCRATIC AND THAT THE OPPORTUNITIES FOR NATIVE GERMANS, LET ALONE FOREIGNERS, ARE SOMEWHAT LIMITED BECAUSE OF THE VAST POWER THAT IS STILL VESTED IN THE GERMAN PROFESSOR WHO IS THE HEAD OF A DEPARTMENT OR LABORATORY.

PERHAPS THOSE VIEWS ARE INCORRECT BUT THEY ARE SO PERCEIVED. ONE MUST REMEMBER THAT AT THE END OF THE 19TH CENTURY AND THE EARLY 20TH CENTURY THE GERMAN SPIRIT OF INTELLECTUAL INQUIRY INTO SCIENCE WAS A VAST LIBERATION FROM THE PATTERNS OF AUTHORITARIAN EDUCATION THAT OCCURRED ELSEWHERE IN EUROPE AND THE UNITED STATES. ONE MUST ALSO KEEP CLEARLY IN MIND THAT THE AMERICANS THAT SOUGHT SCIENTIFIC EDUCATION AMONG THE GREAT EDUCATORS AND SCIENTISTS OF GERMANY WERE NO ORDINARY AMERICANS. THEY WERE DESTINED TO BECOME THE FOUNDERS OF THE IMPORTANT MAJOR DEVELOPMENT IN AMERICAN MEDICAL SCIENCE, AND THEY WERE CLEARLY RECOGNIZED AS HAVING GREAT POTENTIAL ABILITIES BY THE DISTINGUISHED GERMAN SCIENTISTS WHO ACCEPTED THEM INTO THEIR DEPARTMENTS, LABORATORIES AND CLINICS. ONE COULD SEE IN READING LETTERS AND REPORTS OF THAT PERIOD THAT THE POSSIBILITIES OF VASTLY EXTENDING THE BENEFITS OF SCIENCE AND THE INFLUENCE OF THE GERMAN SCIENTISTS TO THE DEVELOPING INSTITUTIONS IN THE UNITED STATES WAS RECOGNIZED BY BOTH THE STUDENTS AND THE TEACHERS. IN FACT, IF THERE WAS ANY DOUBT AT ALL IT WAS ON THE PART OF THE YOUNG AMERICANS OF GREAT ABILITY WHO WERE DESTINED TO BE CRUCIAL IN THE DEVELOPMENT OF AMERICAN MEDICAL SCIENCE THAT THEY MIGHT FIND THIS NEW INTELLECTUAL POWER OF GERMAN SCIENCE UNWELCOME WHEN THEY RETURNED HOME. SOME OF THEM EVEN SPECULATED AS TO WHETHER THEY WOULD BE ABLE TO FIND POSITIONS AND SUPPORT FOR THEIR SCIENTIFIC ACTIVITIES. THEY, OF COURSE,

WERE NOT WHOLLY AWARE OF THE TREMENDOUS FORCES ELSEWHERE IN AMERICAN SOCIETY THAT WOULD BECOME SUPPORTIVE OF THE WIDESPREAD ESTABLISHMENT OF RATIONAL SCIENCE IN MEDICINE IN CONTRADISTINCTION TO THE VITALISM AND THE ALMOST ROMANTIC IDEAS OF MEDICAL INVESTIGATION AND CARE ON THE CLINICAL LEVEL THAT WERE THEN EXTANT IN THE UNITED STATES. IT IS ALMOST AS THOUGH THE NEW WORLD WAS WAITING A RATIONAL APPROACH TO WHAT THEY WERE DOING FOR PATIENTS AND FOUND IT IN THE MARVELOUS DEVELOPMENT OF GERMAN SCIENCE WHICH BROUGHT LIFE SCIENCES INTO THE SAME KIND OF RATIONAL DISCIPLINE AND VERIFICATION THAT OTHER SCIENTISTS HAD DEVELOPED. IT WAS A MOST FORTUNATE COINCIDENCE OF THE RESOURCES BEING AVAILABLE IN GERMANY AND THE YOUNG PEOPLE IN THE UNITED STATES WHO WISHED TO BENEFIT BY THEM.

ON THE CLINICAL LEVEL AT THAT TIME IN THE UNITED STATES NOBODY COULD PRESENT HIMSELF AS A SPECIALIST UNLESS HE HAD HAD THE BENEFIT OF SERIOUS CLINICAL TEACHING AND INVESTIGATION WHICH WERE POSSIBLE AT THAT TIME MAINLY IN THE GERMAN SPEAKING UNIVERSITIES AND TO A LESSOR EXTENT IN THOSE OF FRANCE AND OF THE UNITED KINGDOM.

DURING THE INTERVAL BETWEEN 1870 AND 1914 IT IS ESTIMATED THAT APPROXIMATELY 15,000 AMERICANS STUDIED IN GERMAN UNIVERSITIES, THE VAST MAJORITY OF THEM, OF COURSE BEING CLINICAL POST-GRADUATE STUDENTS. ABOUT 1/3 TO NEARLY 1/2 OF ALL THE AMERICANS WHO ACHIEVED THE STATUS OF SPECIALIST IN THAT PERIOD HAD THE BENEFIT OF AUSTRO-GERMAN EDUCATION.

THE EMPHASIS WAS ON THE STUDY OF SCIENCE FOR A SMALL NUMBER OF OUTSTANDING PEOPLE AND A MUCH LARGER NUMBER OF COMPETENT CLINICAL PEOPLE. NOT VERY MANY AMERICANS CHOSE TO DO THEIR BASIC MEDICAL EDUCATION IN AUSTRIA AND GERMANY, AND TO THAT EXTENT THEREFORE, THE AMERICANS STUDYING IN THE GERMAN UNIVERSITIES WERE PERHAPS A BIT OLDER THAN THEIR GERMAN CONTEMPORARIES AND WERE

VIEWED BY GERMAN MEDICAL EDUCATORS AS SOMEWHAT MORE MATURE. THERE WAS SOME CONCERN ON THE PART OF AMERICANS IN THE LATE VICTORIAN AND EARLY EDWARDIAN PERIOD ABOUT HOW AMERICANS WOULD FARE STUDYING ABROAD, AND AS ONE OF THE HISTORIANS OF THAT PERIOD DR. RODNEY GLISAN PUT IT "LET HIM DO SO AFTER HIS MORAL HABITS HAVE BECOME SO FIXED THAT THEY ARE NOT EASILY UPSET BY SUCH DECEITFUL VANITIES AS WINE AND PROFLIGATE WOMEN." THERE IS AMPLE EVIDENCE THAT MANY AMERICAN STUDENTS WERE TAKEN IN BY THESE "DECEITFUL VANITIES" AND HAD A GOOD TIME IN ADDITION TO THEIR STUDIES ABROAD!

FOR THE CLINICIANS WHO WENT ABROAD FOR POST-GRADUATE EDUCATION, THE VAST MAJORITY OF THEM SOUGHT SPECIAL CLINICAL SKILLS AND IN THE MAIN, THEIR FAVORITE PLACES WERE VIENNA AND BERLIN. MANY OF THE COURSES WERE GIVEN FOR THEM IN THE ENGLISH LANGUAGE FOR A FEE, WHICH UNDOUBTEDLY WAS OF SOME ATTRACTION TO THE GERMAN CLINICIANS AS WELL AS THE AMERICAN STUDENTS. HOWEVER UNLIKE THE SITUATION IN THE UNITED STATES AT THAT TIME, THESE AMERICAN POST-GRADUATE STUDENTS DID ACTUAL CLINICAL WORK IN THE GREAT HOSPITALS OF VIENNA AND BERLIN AND ELSEWHERE IN CENTRAL EUROPE.

TO RETURN TO THE IMPORTANT MINORITY WHO WENT TO STUDY FUNDAMENTAL MEDICAL SCIENCES - THEIR INFLUENCE WAS INCREDIBLE. IT WAS GREATLY DISPROPORTIONATE TO THEIR NUMBERS. THEY WENT MAINLY TO HEIDELBERG, LEIPZIG, STRASSBURG (WHICH WAS OF COURSE THEN GERMAN), AND BRESLAU. THE AMERICANS SUCH AS MALL AND WELCH AND THE MANY OTHERS SPENT YEARS OF EDUCATION WITH THE GREATEST MINDS IN THE MEDICAL SCIENCES AT THAT TIME. THEY BROUGHT BACK THE KIND OF INFORMATION AND DISCIPLINE THAT WAS TO LEAD ULTIMATELY TO THE GREATNESS OF AMERICAN MEDICINE AND AMERICAN RESEARCH. ONE CAN STATE THAT THE INFLUENCE OF THE GERMAN UNIVERSITIES UPON AMERICAN UNIVERSITIES AND

AMERICAN MEDICINE WAS SO VAST AS NOT TO BE EVEN MEASURABLE.

ALL WAS NOT BRIGHT HOWEVER, FOR THESE PEOPLE. FOR INSTANCE, WOMEN WERE FOR THE MOST PART BARRED IN GERMANY AT THAT TIME. THE SWISS HOWEVER, WERE WILLING TO ACCEPT FEMALE STUDENTS AND, IN THE MAIN, WOMEN WENT TO ZURICH AND BERNE WHERE THERE WERE ALSO MANY WOMEN FROM OTHER COUNTRIES ESPECIALLY FROM IMPERIAL RUSSIA. IT WAS ONLY AT THE TURN OF THE CENTURY THAT WOMEN BEGAN TO BE ADMITTED TO GERMAN UNIVERSITIES AND THE FIRST OF THESE WAS THE DISTINGUISHED PHYSICIAN ALICE HAMILTON, WHO INTRODUCED PUBLIC HEALTH KNOWLEDGE FROM HER EXPERIENCES IN GERMANY TO THE UNITED STATES.

WHEN THIS IMPORTANT SMALL NUMBER OF SCIENTIFIC STUDENTS RETURNED THEY WERE WELCOMED ONLY IN A SMALL NUMBER OF INSTITUTIONS AT FIRST. THESE WERE LARGELY IN THE NORTHEASTERN PART OF THE UNITED STATES AT HARVARD, YALE, JOHNS HOPKINS, AND COLUMBIA. THERE WAS AN IMPORTANT SMALL SEGMENT AT THE UNIVERSITIES OF CHICAGO AND MICHIGAN, BUT ALMOST NOWHERE ELSE IN THE UNITED STATES AT THAT PARTICULAR TIME. FROM THE CLINICIAN'S STANDPOINT, AS WAS PREVIOUSLY MENTIONED, VIENNA AND BERLIN WERE THE MOST POPULAR. HOWEVER THERE WAS ALSO POPULARITY BOTH AMONG CLINICIANS AND FUTURE SCIENTISTS AT THE UNIVERSITIES OF HEIDELBERG AND OF GOTTINGEN. GOTTINGEN WAS PARTICULARLY OF INTEREST TO A SMALL NUMBER OF NORTHEASTERN AMERICANS, ESPECIALLY FROM THE NEW YORK AND BOSTON AREAS, BECAUSE IT WAS FOUNDED BY THE BRITISH MONARCH, GEORGE II, WHO WAS ALSO AT THAT TIME THE ELECTOR OF HANNOVER. AMERICANS BELIEVED THAT THE GERMAN SPEECH IN HANNOVER WAS THE MOST PURE FORM OF GERMAN AND WERE ATTRACTED TO IT. THEY WERE ALSO ATTRACTED BECAUSE OF THE RELATIONSHIP OF GEORGE II TO THE DEVELOPMENT OF AMERICAN MEDICINE IN ANOTHER CONNECTION. IT WAS THIS BRITISH MONARCH WHO GRANTED A CHARTER TO THE FIRST AMERICAN MEDICAL SCHOOL IN 1754 WHICH WAS THEN KNOWN AS

KINGS COLLEGE, AND AFTER THE AMERICAN REVOLUTION WAS RENAMED COLUMBIA. A CONTRIBUTING FACTOR ALSO TO THE INTEREST IN HEIDELBERG WAS THE WRITINGS OF MARK TWAIN IN HIS BOOK CALLED "A TRAMP ABROAD." AMERICANS WERE AWARE OF THIS BEAUTIFUL INSTITUTION WHOSE 600TH ANNIVERSARY WE ARE NOW CELEBRATING AND ITS PHYSICAL BEAUTIES IN THE NECKAR VALLEY AS WELL AS THE GREAT SCHLOSS. THE CUSTOMS OF STUDENT LIFE WERE EXCESSIVELY ROMANTICIZED AND EMPHASIS WAS PLACED UPON THE GAY TIMES THAT AMERICANS COULD HAVE IN HEIDELBERG AND THE AMERICAN ROMANTIC FANCY WAS TAKEN BY THE CONTINUED PUBLICATIONS OF SUCH MATTERS AS THE ARISTOCRATIC GERMAN STUDENTS OF THAT PERIOD AND THEIR DISCUSSIONS ON THE PHILOSOPHERS ROAD AND ALSO THE, TO AMERICANS, MOST INTERESTING CUSTOM OF DUELING WHEN THERE WAS AN INSULT EITHER REAL OR FANCIED!

I SHOULD LIKE TO SUMMARIZE THE ENORMOUS INFLUENCE OF WHAT THE MEDICAL WORLD ESPECIALLY IN THE UNITED STATES OWED TO THE UNIVERSITIES OF GERMANY IN THE 19TH CENTURY IN THE WORDS OF SIR WILLIAM OSLER: "I SHOULD SAY THAT THE CHARACTERISTIC WHICH STANDS OUT IN BOLD RELIEF IN GERMAN SCIENTIFIC LIFE IS PARAMOUNT IMPORTANCE OF KNOWLEDGE FOR ITS OWN SAKE. TO KNOW CERTAIN THINGS THOROUGHLY AND TO CONTRIBUTE TO AN INCREASE IN OUR KNOWLEDGE OF THEM SEEMS TO SATISFY THE AMBITION OF MANY OF THE BEST MINDS. THE PRESENCE IN EVERY MEDICAL CENTER OF A CLASS OF MEN DEVOTED TO SCIENTIFIC WORK GIVES A TOTALLY SPECIAL ASPECT TO PROFESSIONAL ASPIRATIONS. WHILE WITH US - AND ENGLAND - THE YOUNG MAN MAY START WITH AN ARDENT DESIRE TO DEVOTE HIS LIFE TO SCIENCE, HE IS SOON DRAGGED INTO THE MILL OF PRACTICE, AND AT 40 YEARS OF AGE THE "GUINEA (OR MONEY) STAMP" IS ON ALL HIS WORK. HIS ASPIRATIONS AND HIS EARLY YEARS OF SACRIFICE HAVE DONE HIM GOOD BUT WE ARE LOSERS AND WE MISS SADLY THE LEAVEN WHICH SUCH A CLASS WOULD BRING INTO OUR PROFESSIONAL LIFE. I HAVE

SAID MUCH IN MY LETTERS OF SPLENDID LABORATORIES AND COSTLY INSTITUTES BUT TO STAND AGAPE BEFORE THE MAGNIFICENT STRUCTURES WHICH ADORN SO MANY UNIVERSITY TOWNS OF GERMANY AND TO WONDER HOW MANY MILLIONS OF MARKS THEY COST AND HOW THEY EVER COULD BE PAID FOR IS THE SORT OF ADMIRATION WHICH CALIBAN YIELDED TO PROSPERO. MEN WILL PAY DEAR FOR WHAT THEY PRIZE DEARLY, AND A TRUE HOMAGE MUST BE GIVEN TO THE SPIRIT WHICH MAKES THIS VAST EXPENDITURE A NECESSITY. TO THAT 'GEIST,' THE ENTIRE WORLD TODAY STANDS DEBTOR, AS OVER EVERY DEPARTMENT OF PRACTICAL KNOWLEDGE HAS ITS SILENTLY BROODED SCIENCE, OFTEN UNRECOGNIZED, SOMETIMES WHEN RECOGNIZED NOT THANKED. THE UNIVERSITIES OF GERMANY ARE HER CHIEF GLORY AND THE GREATEST BOON SHE CAN GIVE TO US IN THE NEW WORLD IS TO RETURN OUR YOUNG MEN INFECTED WITH THE SPIRIT OF EARNESTNESS AND WITH A LOVE OF THOROUGHNESS WHICH CHARACTERIZES THE WORK DONE IN THEM."