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ASTRONOMY NEWS

METHANE DISCOVERY MEANS THERE MAY BE LIFE ON MARS

JAN. 15, 2009

SCIENTISTS USING EARTH-BASED TELESCOPES HAVE TAKEN DETAILED MEASUREMENTS OF THE GAS METHANE ON MARS, A FINDING THAT SUPPORTS THE POSSIBILITY OF UNDERGROUND LIFE.

THE SCIENTISTS, FROM NASA AND OTHER U.S. INSTITUTIONS, FOUND HIGH CONCENTRATIONS OF METHANE THAT ARE CONSISTENT WITH METHANE PLUMES PRODUCED BY UNDERGROUND BACTERIA ON EARTH.

THE OBSERVATIONS HAVE REIGNITED A LIFE-ON-MARS DEBATE THAT BEGAN IN 1996 WHEN NASA ASTROBIOLOGIST DAVID MCKAY AND SEVERAL OTHER COLLEAGUES ANNOUNCED THAT A METEORITE FROM MARS CONTAINED EVIDENCE OF BACTERIA.

SINCE THEN, IN ABSENCE OF MORE SUBSTANTIVE PROOF, MOST SCIENTISTS HAVE DISCOUNTED MCKAY’S FINDINGS. BUT THAT MAY NOW CHANGE.

“I THINK THIS IS EXTREMELY STRONG EVIDENCE FOR CURRENT LIFE ON MARS,” SAID MCKAY, WHO WORKS AT JOHNSON SPACE CENTER.

“IT DOESN’T PROVE IT. BUT, TO ME, THAT IS VERY STRONG SUPPORT FOR THE MICROBIAL LIFE THEORY THAT WE HAVE BEEN PROMOTING WITH EVIDENCE FOR A NUMBER OF YEARS.”

THE NEW METHANE DATA, COLLECTED BY NASA SENIOR SCIENTIST MICHAEL MUMMA AND OTHER PLANETARY SCIENTISTS, FOUND THAT CONCENTRATIONS OF THE GAS VARIED GREATLY BY LOCATION AND SEASON ON MARS.

THE PRIMARY PLUME THEY FOUND CONTAINED ABOUT 19,000 METRIC TONS OF METHANE, WHICH IS COMPARABLE TO THE METHANE PRODUCED AT THE LARGE HYDROCARBON SEEP COAL OIL POINT IN CALIFORNIA, WHERE UNDERWATER BACTERIA PRODUCE METHANE BY PROCESSING HYDROCARBONS.

FURTHER STUDIES DURING FUTURE MISSIONS TO MARS ARE NEEDED TO DETERMINE WHETHER THE METHANE ORIGINATES FROM BIOLOGICAL OR NON-BIOLOGICAL SOURCES.

ALTHOUGH IT IS POSSIBLE TO PRODUCE METHANE THROUGH INORGANIC PROCESSES, THOSE TYPICALLY DO NOT PRODUCE THE CONCENTRATIONS OF METHANE OBSERVED ON MARS.

“THESE METHANE CONCENTRATIONS ARE AN INDICATOR THAT THERE MIGHT BE LIFE,” SAID PAUL CLOUTIER, A RICE UNIVERSITY ASTRONOMER WHO SERVED AS A PRINCIPAL INVESTIGATOR ON THE MARS GLOBAL SURVEYOR, A SPACECRAFT THAT ORBITED, AND COLLECTED DATA ABOUT MARS FROM 1997 TO 2006.

“IF METHANE WERE ABSENT, YOU WOULD BE ABLE TO ARGUE MORE FORCEFULLY THERE ISN’T LIFE ON MARS.”

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'SPACE BLOB' BAFFLES ASTRONOMERS

4/23/2009

IT IS A "LYMAN-ALPHA BLOB" AND IS 55,000 LIGHT YEARS ACROSS - AS LARGE AS PRESENT-DAY GALAXIES.

THOUGH YOUNGER SUCH BLOBS HAVE BEEN FOUND, "HIMIKO" CONFOUNDS THE IDEA THAT SUCH LARGE OBJECTS GREW MORE RECENTLY BY THE MERGER OF SMALLER ONES.

THE RESEARCH WILL BE PUBLISHED IN THE ASTROPHYSICAL JOURNAL.

CURRENT COSMOLOGY MODELS HOLD THAT BETWEEN 200 MILLION AND ONE BILLION YEARS AFTER THE BIG BANG, THE FIRST COLOSSAL STARS FORMED, EMITTING RADIATION THAT STRIPPED LIGHT ELEMENTS OF THEIR ELECTRONS AND TURNED THE UNIVERSE INTO A SOUP OF CHARGED PARTICLES.

ONLY AFTER THIS "RE-IONISATION EPOCH" DID MATTER AS WE NOW KNOW IT REALLY START TO CLUMP TOGETHER.

A NUMBER OF THEORIES OF LYMAN-ALPHA BLOB FORMATION ABOUND, BUT ALL ARE DIFFICULT TO TEST

JAMES GEACH

UNIVERSITY OF DURHAM

OBJECTS AS BIG AS MODERN-DAY GALAXIES SHOULD HAVE TAKEN SIGNIFICANT TIME TO BUILD UP FROM MERGERS OF SMALLER CHUNKS OF MATTER.

SO WHEN A GROUP OF RESEARCHERS LED BY MASAMI OUCHI AT THE CARNEGIE INSTITUTION SEARCHED AMONG 207 DISTANT GALAXY CANDIDATES USING THE SUBARU TELESCOPE AT THE PEAK OF MAUNA KEA IN HAWAII, THEY EXPECTED TO FIND SMALLER GALAXIES.

"WE HESITATED TO SPEND OUR PRECIOUS TELESCOPE TIME BY TAKING SPECTRA OF THIS WEIRD CANDIDATE," DR OUCHI SAID.

"WE NEVER BELIEVED THAT THIS BRIGHT AND LARGE SOURCE WAS A REAL DISTANT OBJECT."

MASSIVE MYSTERY

THE TEAM WENT ON TO MEASURE THE CHARACTERISTIC EMISSION FROM HYDROGEN - THE LYMAN-ALPHA RADIATION OF THE NAME - AND CONFIRMED THE BLOB WAS SOME 12.9 BILLION LIGHT YEARS AWAY.

THEY THEN TRAINED THE SPITZER SPACE TELESCOPE, VERY LARGE ARRAY AND UK INFRARED TELESCOPE ON THE OBJECT TO DETERMINE HOW MUCH MASS IS CONTAINED IN THE BLOB - OR, RATHER, HOW MUCH WAS CONTAINED 12.9 BILLION YEARS AGO.

HIMIKO - NAMED AFTER A MYSTERIOUS QUEEN OF CHINESE AND JAPANESE LEGEND - CONTAINS MORE THAN 10 TIMES AS MUCH MASS AS GALAXIES OF A SIMILAR AGE.

THE BLOB WAS FIRST NOTICED IN DATA FROM THE SUBARU TELESCOPE

"THERE ARE TWO POSSIBILITIES: THE STANDARD SCENARIO OF GALAXY FORMATION IS WRONG, OR THIS PARTICULAR OBJECT IS SHOWING SOMETHING UNIQUE," DR OUCHI TOLD BBC NEWS.

A RANGE OF POSSIBILITIES COULD EXPLAIN THE MASSIVE NATURE OF HIMIKO: IT COULD HAVE A SUPERMASSIVE BLACK HOLE AT ITS CENTRE, OR PERHAPS IT IS A SINGLE GIANT GALAXY WITH A LARGE MASS OF ABOUT 40 BILLION SUNS.

DR OUCHI SAID THE TEAM WAS PROPOSING OBSERVATIONS USING THE KECK TELESCOPE IN THE FAR-INFRARED REGION TO ESTABLISH THE RATE OF STAR FORMATION HAPPENING INSIDE HIMIKO, AND WHETHER STAR FORMATION COULD LEAD TO THE "NEBULA" OF IONISED GAS THAT ACCOUNTS FOR ITS ENORMOUS SIZE.

"MANY EARLY THEORIES OF GALAXY FORMATION PREDICTED A LYMAN-ALPHA 'FUZZ' AROUND EARLY GALAXIES," SAID JAMES GEACH, AN ASTRONOMER AT THE UNIVERSITY OF DURHAM WHO WORKS ON LYMAN-ALPHA BLOBS.

"THE PROBLEM IS THAT NO-ONE IS ENTIRELY SURE WHAT MECHANISM GIVES RISE TO THE EXTENDED EMISSION; A NUMBER OF THEORIES OF LYMAN-ALPHA BLOB FORMATION ABOUND, BUT ALL ARE DIFFICULT TO TEST," HE TOLD BBC NEWS.

"WE NOW HAVE SEVERAL GOOD MODELS THAT SEEM TO DO A GOOD JOB OF REPRODUCING MANY QUALITIES OF THE OBSERVABLE UNIVERSE.

"THERE IS ROOM FOR IMPROVEMENT HOWEVER, AND EXPLAINING THESE LYMAN-ALPHA BLOBS IS A PRIME EXAMPLE."

BOTH DR OUCHI AND DR GEACH AGREE THAT FUTURE "WIDE-FIELD" SEARCHES THAT SCAN LARGER SWATHES OF THE SKY ARE LIKELY TO UNCOVER MANY MORE SUCH EXTENDED BLOBS.

BUT, DR GEACH ADDED, "UNTIL WE KNOW MORE ABOUT THEIR PHYSICS, THEIR CONNECTION TO THE FORMATION OF GALAXIES, AND PERHAPS MOST IMPORTANTLY THEIR LIFETIMES, WE DON'T REALLY KNOW HOW THEY FIT IN".

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WHY IS MOON DUST STICKY? PHYSICIST SAYS HE HAS ANSWER

4/23/2009

ONE OF THE BIGGEST PROBLEMS FACING AMERICA'S SPACE AGENCY AS IT PREPARES TO RETURN TO THE MOON IS HOW TO MANAGE LUNAR DUST. IT GETS INTO EVERYTHING. WORSE, IT'S STICKY, ADHERING TO SPACESUITS AND POSING A POTENTIALLY SERIOUS HEALTH HAZARD TO FUTURE COLONISTS.

NOW, A SCIENTIST WHO HAS BEEN STUDYING THE PROBLEM OFF AND ON OVER FOUR DECADES THINKS HE MAY HAVE UNTANGLED THE MYSTERY OF WHY THAT DUST IS SO STICKY. BRIAN O'BRIEN, AN AUSTRALIAN PHYSICIST WHO WORKED ON THE APOLLO PROGRAM IN THE 1960S, SAID THE SUN'S ULTRAVIOLET AND X-RAY RADIATION GIVES A POSITIVE CHARGE TO THE DUST, MAKING IT STICK TO SURFACES SUCH AS SPACESUITS.

THIS DOESN'T HAPPEN ON EARTH BECAUSE OUR ATMOSPHERE SCREENS OUT MUCH OF THE SUN'S HARMFUL RADIATION.

THE MOON'S ATMOSPHERE IS SO THIN THAT THE RAYS EASILY REACH THE SURFACE.

O'BRIEN'S MOST IMPORTANT FINDING, AT LEAST FOR NASA'S PURPOSES IN PLANNING FOR A RETURN TO THE MOON BY 2020, IS THAT THE ANGLE OF THE SUN'S RAYS INFLUENCES THE STICKINESS. THE MORE DIRECT THE SUNLIGHT, HE SAID, THE STICKIER THE DUST.

O'BRIEN'S INTEREST IN LUNAR DUST DATES TO 1965, WHEN HE WAS AT HOUSTON'S RICE UNIVERSITY, WHERE HE WAS SELECTED AS THE LEAD SCIENTIST FOR SEVEN LUNAR EXPERIMENTS DESIGNED FOR THE APOLLO PROGRAM. HE BEGAN WORRYING THAT LUNAR DUST COULD CLOG HIS DEVICES AND RUIN THE EXPERIMENTS.

LUNAR DUST IS "A BLOODY NUISANCE," O'BRIEN SAID IN A STATEMENT.

IN 1970, HE PUBLISHED A PAPER SHOWING THAT LUNAR DUST KICKED UP BY THE APOLLO 11 LUNAR MODULE THAT CARRIED NEIL ARMSTRONG AND BUZZ ALDRIN BACK TO SPACE COATED THE SURFACE OF A SEISMOMETER LEFT BEHIND ON THE MOON'S SURFACE. THE GROUND MOTION SENSOR OVERHEATED AND FAILED AFTER THREE YEARS.

MORE THAN THREE DECADES LATER, IN 2006, O'BRIEN'S FASCINATION WITH LUNAR DUST WAS REKINDLED WHEN HE LEARNED THAT NASA HAD MISPLACED THE ORIGINAL TAPES FROM HIS DUST-DETECTING EXPERIMENTS, HE SAID IN AN E-MAIL FROM HIS HOME OUTSIDE PERTH, AUSTRALIA. O'BRIEN DUG UP HIS OWN COLLECTION OF 173 TAPES AND SET ABOUT TRYING TO UNDERSTAND THE BEHAVIOR OF THE DUST ONCE MORE.

NOW 75 AND RETIRED, HE TRACED HIS DESIRE TO UNRAVEL THE 40-YEAR-OLD PROBLEM TO "OLD-FASHIONED ENDURING INTEREST AND, I SUPPOSE, CURIOSITY."

OVER TWO YEARS OF PAINSTAKING RESEARCH, O'BRIEN TRACKED THE DUST ACCUMULATING ON TWO SOLAR CELLS, ONE HORIZONTAL AND ONE VERTICAL, OVER THE COURSE OF TWO LUNAR DAYS. THAT MAY NOT SOUND LIKE MUCH TIME, BUT A LUNAR DAY EQUALS NEARLY 30 DAYS ON EARTH.

HE FOUND THAT LITTLE DUST COLLECTED ON THE HORIZONTAL CELL IN THE LUNAR MORNING, WHEN THE SUN'S RAYS WERE SLANTED, WHILE MORE DUST ADHERED TO THE VERTICAL CELL, WHICH MORE DIRECTLY FACED THE RISING SUN.

THE WEAKER THE SUN'S RAYS, HE FOUND, THE WEAKER THE ELECTROSTATIC FORCES CAUSING THE DUST PARTICLES TO STICK, UNTIL THE DUST FELL OFF.

SOME SCIENTISTS BELIEVE THAT ONE OF THE GREATEST CHALLENGES FOR FUTURE LUNAR COLONISTS WILL BE KEEPING THEIR LUNGS FREE OF THE PARTICLES, EACH THINNER THAN A HUMAN HAIR BUT SHARP AS A RAZOR.

BASED ON HIS RESEARCH, WHICH IS TO BE PUBLISHED IN THE JOURNAL GEOPHYSICAL RESEARCH LETTERS, O'BRIEN THINKS COLONISTS WILL BE ABLE TO COMBAT THE DUST PROBLEM WITH A PRACTICAL, EARTH-TESTED SOLUTION: OLD-FASHIONED SUNSCREEN.

THERE MIGHT BE OTHER APPROACHES, O'BRIEN SAID, BUT "I LEAVE THAT STUFF TO THE ENGINEERS RESPONSIBLE FOR THE SAFETY OF THE ASTRONAUTS."

NASA'S JOHNSON SPACE CENTER IN HOUSTON, THE HOME OF THE MANNED SPACEFLIGHT PROGRAM, IS WORKING ON THE DUST PROBLEM TOO. SEVERAL SCIENTISTS THERE HAVE BEEN IN CONTACT WITH O'BRIEN, ACCORDING TO THE CENTER'S PRESS OFFICE. OFFICIALS DIDN'T CHALLENGE O'BRIEN'S FINDINGS NOR DID THEY ENDORSE THEM.

"THERE ARE SEVERAL MODELS THAT PREDICT HOW LUNAR DUST BEHAVES ON THE MOON AND VERY LITTLE EVIDENCE TO VALIDATE THOSE MODELS," SAID JOSH BYERLY, A PUBLIC AFFAIRS OFFICER AT JOHNSON. "WE PROBABLY WILL NOT KNOW ITS TRUE BEHAVIOR UNTIL WE RETURN."

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THE SCIENCE SEGMENT

FOUNTAIN OF YOUTH DISCOVERED!

2/3/09

A POTENTIALLY "IMMORTAL" JELLYFISH SPECIES THAT CAN AGE BACKWARD—THE BENJAMIN BUTTON OF THE DEEP—IS SILENTLY INVADING THE WORLD'S OCEANS, SWARM BY SWARM, A RECENT STUDY SAYS.

LIKE THE BRAD PITT MOVIE CHARACTER, THE IMMORTAL JELLYFISH TRANSFORMS FROM AN ADULT BACK INTO A BABY, BUT WITH AN ADDED BONUS: UNLIKE BENJAMIN BUTTON, THE JELLYFISH CAN DO IT OVER AND OVER AGAIN—THOUGH APPARENTLY ONLY AS AN EMERGENCY MEASURE.

ABOUT AS WIDE AS A HUMAN PINKY NAIL WHEN FULLY GROWN, THE IMMORTAL JELLYFISH (SCIENTIFIC NAME: TURRITOPSIS DOHRNII) WAS DISCOVERED IN THE MEDITERRANEAN SEA IN 1883. BUT ITS UNIQUE ABILITY WAS NOT DISCOVERED UNTIL THE 1990S.

HOW THE JELLYFISH BECOMES "IMMORTAL"

TURRITOPSIS TYPICALLY REPRODUCES THE OLD-FASHIONED WAY, BY THE MEETING OF FREE-FLOATING SPERM AND EGGS. AND MOST OF THE TIME THEY DIE THE OLD-FASHIONED WAY TOO.

BUT WHEN STARVATION, PHYSICAL DAMAGE, OR OTHER CRISES ARISE, "INSTEAD OF SURE DEATH, [TURRITOPSIS] TRANSFORMS ALL OF ITS EXISTING CELLS INTO A YOUNGER STATE," SAID STUDY AUTHOR MARIA PIA MIGLIETTA, A RESEARCHER AT PENNSYLVANIA STATE UNIVERSITY.

THE JELLYFISH TURNS ITSELF INTO A BLOBLIKE CYST, WHICH THEN DEVELOPS INTO A POLYP COLONY, ESSENTIALLY THE FIRST STAGE IN JELLYFISH LIFE.

THE JELLYFISH'S CELLS ARE OFTEN COMPLETELY TRANSFORMED IN THE PROCESS. MUSCLE CELLS CAN BECOME NERVE CELLS OR EVEN SPERM OR EGGS.

THROUGH ASEXUAL REPRODUCTION, THE RESULTING POLYP COLONY CAN SPAWN HUNDREDS OF GENETICALLY IDENTICAL JELLYFISH—NEAR PERFECT COPIES OF THE ORIGINAL ADULT.

THIS UNIQUE APPROACH TO HARDSHIP MAY BE HELPING TURRITOPSIS SWARMS SPREAD THROUGHOUT THE WORLD'S OCEANS, SHE ADDED.

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THE ARENA GOES ABROAD

KENYA - MAN BITES SNAKE IN EPIC STRUGGLE

4/15/2009

A KENYAN MAN BIT A PYTHON WHICH WRAPPED HIM IN ITS COILS AND DRAGGED HIM UP A TREE DURING A FIERCE THREE-HOUR STRUGGLE, POLICE HAVE TOLD THE BBC.

THE SERPENT SEIZED FARM WORKER BEN NYAUMBE IN THE MALINDI AREA OF KENYA'S INDIAN OCEAN COAST AT THE WEEKEND.

MR NYAUMBE BIT THE SNAKE ON THE TIP OF THE TAIL DURING THE EXHAUSTING BATTLE IN THE VILLAGE OF SABAKI.

POLICE RESCUED MR NYAUMBE AND CAPTURED THE 13FT (4M) REPTILE, BEFORE TAKING IT TO A SANCTUARY, BUT IT LATER ESCAPED.

THE VICTIM TOLD POLICE HE MANAGED TO REACH HIS MOBILE PHONE FROM HIS POCKET TO RAISE THE ALARM WHEN THE PYTHON MOMENTARILY EASED ITS GRIP AFTER HAULING HIM UP A TREE ON SATURDAY EVENING.

MR NYAUMBE USED HIS SHIRT TO SMOTHER THE SNAKE'S HEAD AND PREVENT IT FROM SWALLOWING HIM.

HIS EMPLOYER ARRIVED WITH POLICE AND VILLAGERS, WHO TIED THE PYTHON WITH A ROPE AND PULLED THEM BOTH DOWN FROM THE TREE WITH A THUD.

PETER KATAM, SUPERINTENDENT OF POLICE IN MALINDI DISTRICT, TOLD THE BBC NEWS WEBSITE: "TWO OFFICERS ON PATROL WERE CALLED AND THEY FOUND THIS MAN WAS STRUGGLING WITH A SNAKE ON A TREE.

"THE SNAKE HAD COILED HIS HANDS AND WAS TRYING TO SWALLOW HIM BUT HE STRUGGLED VERY HARD. THE OFFICERS AND VILLAGERS MANAGED TO RESCUE HIM AND HE WAS FREED.

"HE HIMSELF WAS INJURED ON THE LOWER LIP OF THE MOUTH - IT WAS BLEEDING A LITTLE BIT - AS THE TIP OF THE SNAKE'S TAIL WAS SHARP WHEN HE SAID HE BIT IT."

MR NYAUMBE TOLD THE DAILY NATION NEWSPAPER HOW HE RESORTED TO DESPERATE MEASURES AFTER THE PYTHON, WHICH HAD APPARENTLY BEEN HUNTING LIVESTOCK, ENCIRCLED HIS UPPER BODY IN ITS COILS.

"I STEPPED ON A SPONGY THING ON THE GROUND AND SUDDENLY MY LEG WAS ENTANGLED WITH THE BODY OF A HUGE PYTHON," HE SAID.

"I HAD TO BITE IT."

'VERY MYSTERIOUS'

SUPT KATAM TOLD THE BBC THE OFFICERS HAD WANTED TO SHOOT THE SNAKE BUT COULD NOT DO SO FOR FEARING OF INJURING MR NYAUMBE.

"IF IT WASN'T FOR THE VILLAGERS AND OFFICERS WHO HELPED HIM, HE WOULD HAVE BEEN SWALLOWED BY THE SNAKE OVER THE EASTER HOLIDAY," SAID SUPT KATAM.

HE ADDED: "IT'S VERY MYSTERIOUS, THIS ABILITY TO LIFT THE MAN ONTO THE TREE. I'VE NEVER HEARD OF THIS BEFORE."

THE POLICE OFFICER SAID THEY TOOK THE SNAKE TO A SANCTUARY IN MALINDI TOWN BUT IT ESCAPED OVERNIGHT, PROBABLY FROM A GAP UNDER THE DOOR IN THE ROOM WHERE IT WAS KEPT.

"WE ARE STILL SERIOUSLY LOOKING FOR THE SNAKE," SAID SUPT KATAM. "WE WANT TO ARREST THE SNAKE BECAUSE ANY ONE OF US COULD FALL A VICTIM."

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FAMOUS QUOTES

JAMES MADISON (1751 – 1836) 85 YEARS.

HE WAS AN AMERICAN POLITICIAN AND POLITICAL PHILOSOPHER WHO SERVED AS THE FOURTH PRESIDENT OF THE UNITED STATES (1809–1817), AND ONE OF THE FOUNDING FATHERS OF THE UNITED STATES. CONSIDERED TO BE THE "FATHER OF THE CONSTITUTION", HE WAS THE PRINCIPAL AUTHOR OF THE DOCUMENT. IN 1788, HE WROTE OVER A THIRD OF THE FEDERALIST PAPERS, STILL THE MOST INFLUENTIAL COMMENTARY ON THE CONSTITUTION. THE FIRST PRESIDENT TO HAVE SERVED IN THE UNITED STATES CONGRESS, HE WAS A LEADER IN THE 1ST UNITED STATES CONGRESS, DRAFTED MANY BASIC LAWS AND WAS RESPONSIBLE FOR THE FIRST TEN AMENDMENTS TO THE CONSTITUTION (SAID TO BE BASED ON THE VIRGINIA DECLARATION OF RIGHTS), AND THUS IS ALSO KNOWN AS THE "FATHER OF THE BILL OF RIGHTS". AS A POLITICAL THEORIST, MADISON'S MOST DISTINCTIVE BELIEF WAS THAT THE NEW REPUBLIC NEEDED CHECKS AND BALANCES TO PROTECT INDIVIDUAL RIGHTS FROM THE TYRANNY OF THE MAJORITY.

AS JEFFERSON'S SECRETARY OF STATE (1801–1809), MADISON SUPERVISED THE LOUISIANA PURCHASE, DOUBLING THE NATION'S SIZE, AND SPONSORED THE ILL-FATED EMBARGO ACT OF 1807. AS PRESIDENT, HE LED THE NATION INTO THE WAR OF 1812 AGAINST GREAT BRITAIN IN ORDER TO PROTECT THE UNITED STATES' ECONOMIC RIGHTS. DURING AND AFTER THE WAR, MADISON REVERSED MANY OF HIS POSITIONS. BY 1815, HE SUPPORTED THE CREATION OF THE SECOND NATIONAL BANK, A STRONG MILITARY, AND A HIGH TARIFF TO PROTECT THE NEW FACTORIES OPENED DURING THE WAR.

"DURING ALMOST FIFTEEN CENTURIES HAS THE LEGAL ESTABLISHMENT OF CHRISTIANITY BEEN ON TRIAL.

WHAT HAS BEEN ITS FRUITS?

MORE OR LESS, IN ALL PLACES, PRIDE AND INDOLENCE IN THE CLERGY;

IGNORANCE AND SERVILITY IN THE LAITY;

IN BOTH, SUPERSTITION, BIGOTRY AND PERSECUTION."