

STORY BY ERICA NAONE
ART BY TOMER AND ASAF HANUKA

MISSION TO MARS

A TRUE STORY

AUGUST 21, 1993

THE MARS OBSERVER IS THREE DAYS AWAY FROM ENTERING MARS ORBIT. BASED ON A COMMERCIAL EARTH-ORBITING COMMUNICATIONS SATELLITE, THE OBSERVER IS THE FIRST CRAFT TO VISIT MARS SINCE THE VIKINGS IN THE 1970S. ITS \$813 MILLION MISSION IS TO UNLOCK THE SECRETS OF THE RED PLANET'S SURFACE, ITS MAGNETIC AND GRAVITATIONAL FIELDS, AND ITS CLIMATE.

SUNDAY, AUGUST 22, 8:30 A.M.



WE LOST CONTACT WITH THE SPACECRAFT. IT LOOKS VERY BAD.

DANIEL MCCLEESE,
PRINCIPAL INVESTIGATOR,
PRESSURE MODULATOR
INFRARED RADIOMETER
(PMIRR), MARS OBSERVER

AUGUST 24



THE SCIENTISTS GATHER AT THE JET PROPULSION LABORATORY TO WAIT FOR OBSERVER TO SIGNAL THAT IT HAS ENTERED MARTIAN ORBIT. THEY HAVE VERY LITTLE HOPE.

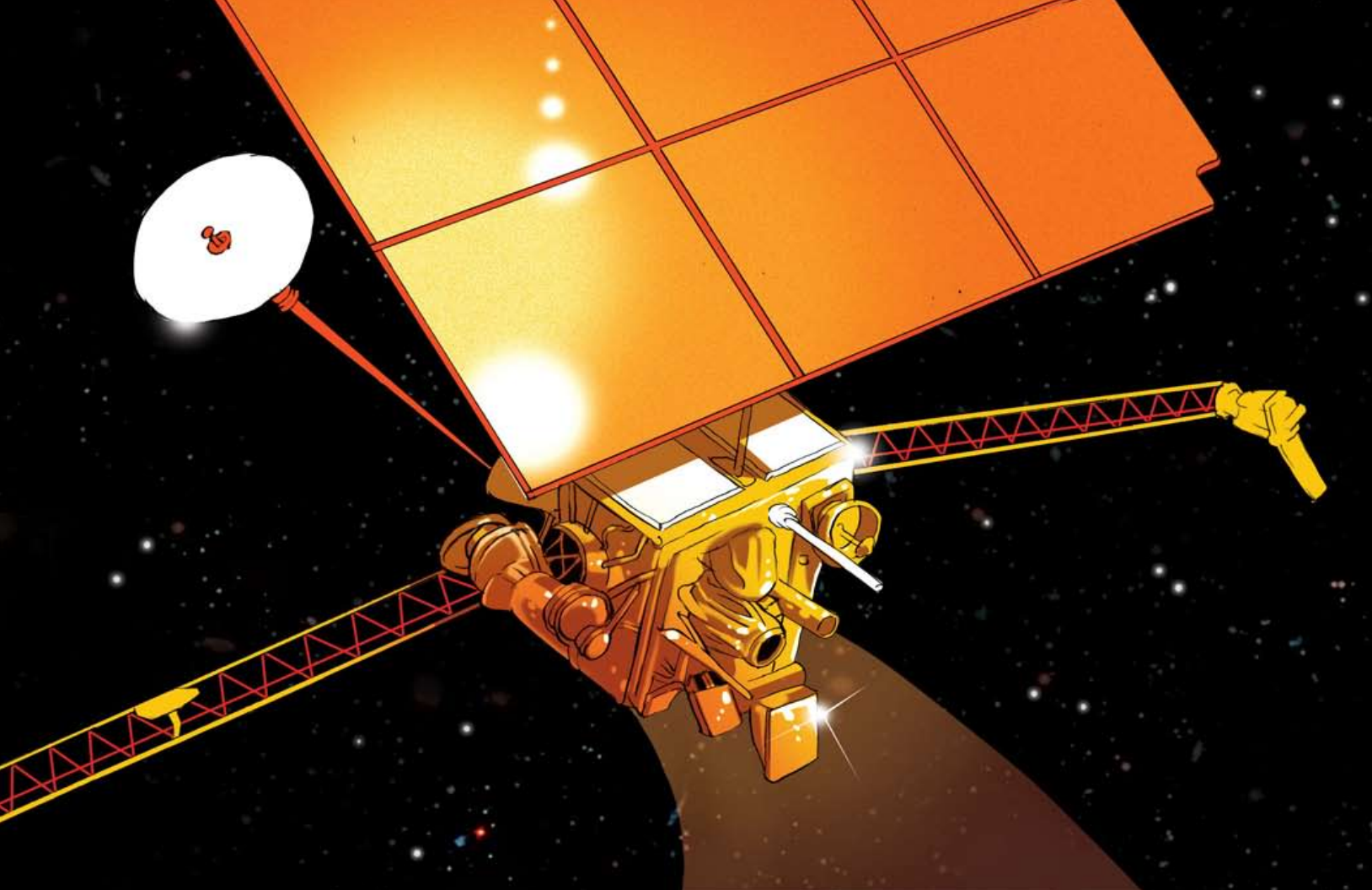


MCCLEESE

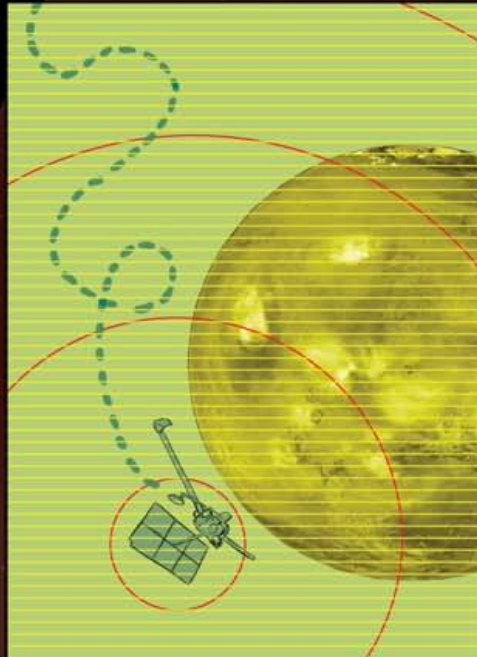
BOYNTON

PAIGE

SOME OF THE SCIENTISTS HAVE BEEN WORKING ON THE MARS OBSERVER SINCE THE EARLY 1980S.



MORE THAN 170 HUMAN-YEARS OF LABOR WENT INTO THE DESIGN AND CONSTRUCTION OF JUST THE THERMAL EMISSION SPECTROMETER, AN INSTRUMENT DESIGNED TO STUDY THE COMPOSITION OF ROCKS AND MINERALS ON THE MARTIAN SURFACE.



MOST LIKELY, THE OBSERVER'S FUEL LINES HAVE RUPTURED.

THERE IS NO WAY TO KNOW FOR SURE. THE SCIENTISTS SEARCH FOR SIGNS THAT THE SPACECRAFT WENT INTO ORBIT AROUND MARS, OR EVEN THE SUN.

THEY FIND NOTHING.

1994

NASA HAS LAUNCHED NO REPLACEMENT FOR OBSERVER. THOUGH THE CUSTOM HAS BEEN TO SEND SPACECRAFT OUT IN PAIRS, IN CASE ONE IS LOST...



...COPIES OF THE INSTRUMENTS ON OBSERVER REMAIN ON THE GROUND, IN STORAGE AT THE SPACE CONTRACTOR'S FACILITY, UNASSEMBLED.

WILLIAM BOYNTON,
PRINCIPAL INVESTIGATOR,
GAMMA RAY SPECTROMETER,
MARS OBSERVER

WE HAVE SOME SPARE PARTS. WE COULD BUILD ANOTHER OBSERVER AND LAUNCH AGAIN.



DANIEL GOLDIN, HEAD OF NASA

IT'S TOO MUCH TO RISK ALL THE INSTRUMENTS IN ONE CRAFT. WE CAN FLY THEM IN THREE MISSIONS, CHEAPER MISSIONS.



GO TO MARS EVERY TWO YEARS, NOT EVERY TEN. WE'LL WIN SOME AND LOSE SOME...

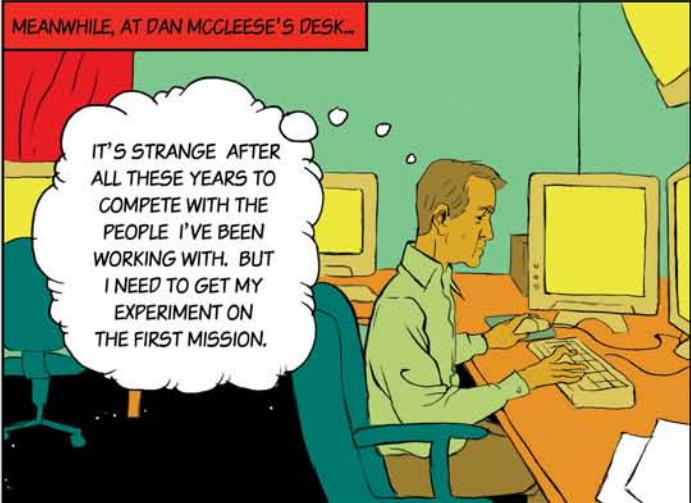


BUT WE WON'T LOSE ALL



MEANWHILE, AT DAN MCCLEESE'S DESK...

IT'S STRANGE AFTER ALL THESE YEARS TO COMPETE WITH THE PEOPLE I'VE BEEN WORKING WITH. BUT I NEED TO GET MY EXPERIMENT ON THE FIRST MISSION.



HOW CAN I BE SURE NASA WILL REALLY FLY THE SECOND? OR THE THIRD?



1996

MCCLEESE'S EXPERIMENT, INTENDED TO INVESTIGATE THE MARTIAN ATMOSPHERE, WASN'T INCLUDED WITH THE FIRST SET OF GOLDIN'S "FASTER, BETTER, CHEAPER" MISSIONS:



THE MARS GLOBAL SURVEYOR AND THE PATHFINDER, BOTH LAUNCHED IN 1996.

1998

MCCLEESE PREPARES THE EXPERIMENT FOR THE CLIMATE ORBITER, WHICH WILL FLY IN THE SECOND SET...



DAVID PAIGE, PRINCIPAL INVESTIGATOR FOR THE PAYLOAD FOR THE POLAR LANDER

...AS WILL ITS SISTER CRAFT, THE POLAR LANDER.

BOTH MISSIONS WILL INVESTIGATE THE MARTIAN CLIMATE, SEARCHING FOR SIGNS OF THE CHANGE THAT RENDERED MARS LIFELESS.



THE PATHFINDER TEAM'S SUCCESS HAS TURNED UP THE PRESSURE FOR THE 1998 MISSIONS TO SUCCEED.



TIGHT ON TIME AND MONEY, THE SCIENTISTS WORK FEVERISHLY TO READY THEIR INSTRUMENTS FOR THE SPACECRAFT.



DAVE, WE'RE LAUNCHING TWO SPACECRAFT FOR THE PRICE OF ONE PATHFINDER!



IF THIS WORKS, GUESS WHAT THE NEXT TEAM WILL HAVE TO PULL OFF!

RICHARD ZUREK, PROJECT SCIENTIST, POLAR LANDER

September 23, 1999

CLIMATE ORBITER PREPARES TO ENTER MARTIAN ORBIT.





NO SIGNAL?
WHAT HAPPENED?

IT MISSED THE TARGET ENTRY POINT?
WHAT WAS THE MISS DISTANCE?

IT MAY BE ONLY
60 KILOMETERS
ABOVE THE SURFACE.

IT'LL BURN
UP IN THE
ATMOSPHERE.

IT'S LIKE WATCHING
A HIKER FALL OFF
A CLIFF TO HIS DOOM.

ONE TEAM OF CLIMATE ORBITER ENGINEERS
HAD USED METRIC UNITS, AND ANOTHER
HAD USED ENGLISH UNITS.

PAIGE'S TEAM FALLS UNDER
INTENSE SCRUTINY.

IT CAN'T AFFORD THIS KIND OF MISTAKE
WITH POLAR LANDER, WHOSE LANDING IS
ONLY THREE MONTHS AWAY.

December 3, 1999

POLAR LANDER PREPARES TO LAND ON MARS, NEAR THE SOUTH POLE, WHERE IT IS TO SPEND THE THREE-MONTH POLAR SUMMER DIGGING UNDER THE FROZEN SURFACE.



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IT'S LIKE A LOST HIKER. WE HAVEN'T HEARD BACK, BUT WE CAN'T BE SURE IT'S LOST. NOT YET.

OKAY. LET'S GO THROUGH THE PROTOCOLS HERE. COULD THE RADIO BE BROKEN? DO WE HAVE ANY SIGN THE LANDER CRASHED?

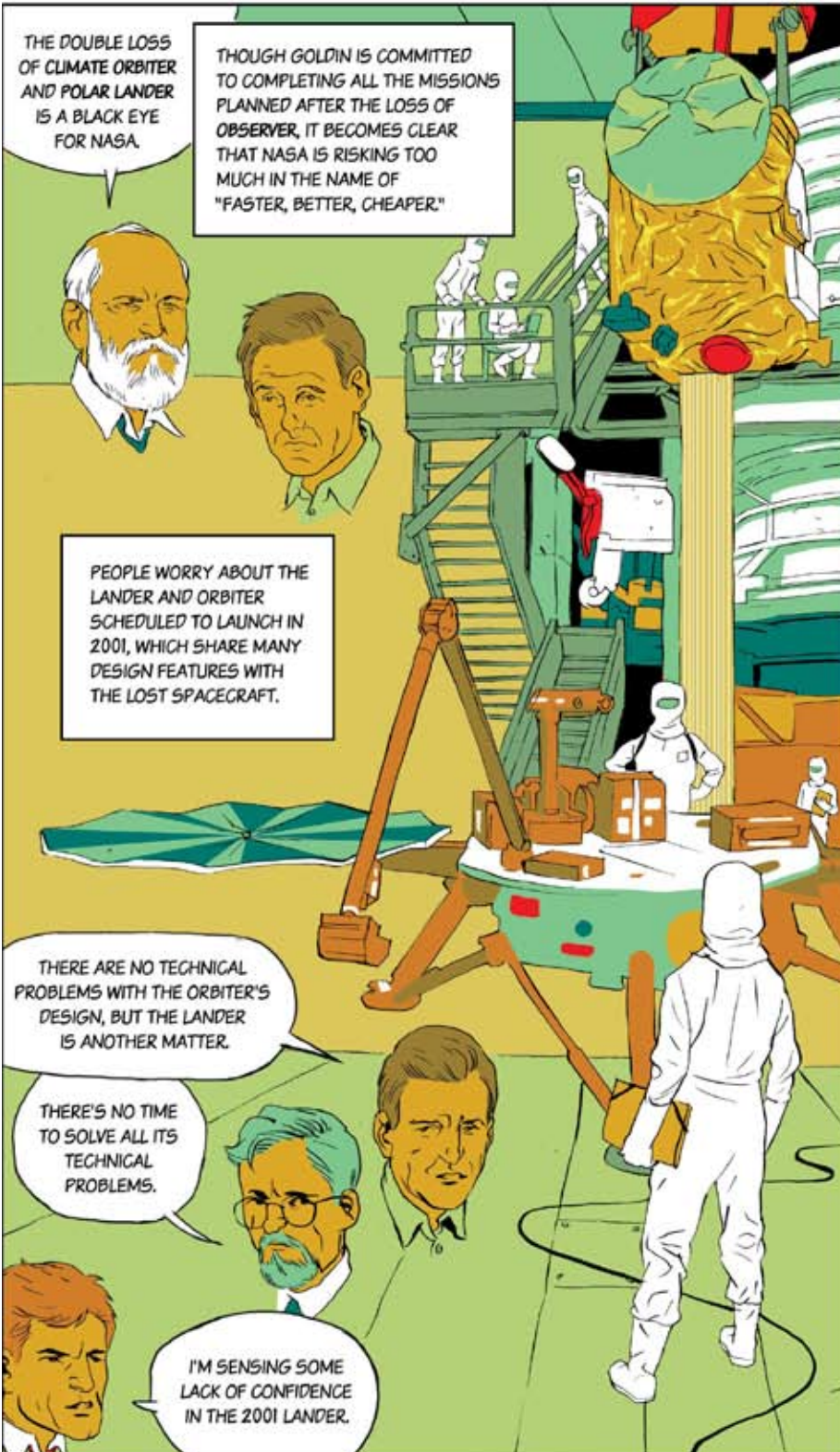
HOW SAFE WAS THE LANDING SITE?

I NEVER WANT TO LAND ON A PLANET AGAIN WITHOUT HIGH-RESOLUTION IMAGES OF THE LANDING SITE.

POLAR LANDER HAS DISAPPEARED WITHOUT A TRACE.

THE SEARCH CONTINUES THROUGH THE MARTIAN POLAR SUMMER...

BUT IN FEBRUARY 2000, PAIGE E-MAILS HIS TEAM TO SEND ITS MEMBERS HOME.



THE DOUBLE LOSS OF CLIMATE ORBITER AND POLAR LANDER IS A BLACK EYE FOR NASA.

THOUGH GOLDIN IS COMMITTED TO COMPLETING ALL THE MISSIONS PLANNED AFTER THE LOSS OF OBSERVER, IT BECOMES CLEAR THAT NASA IS RISKING TOO MUCH IN THE NAME OF "FASTER, BETTER, CHEAPER."

PEOPLE WORRY ABOUT THE LANDER AND ORBITER SCHEDULED TO LAUNCH IN 2001, WHICH SHARE MANY DESIGN FEATURES WITH THE LOST SPACECRAFT.

THERE ARE NO TECHNICAL PROBLEMS WITH THE ORBITER'S DESIGN, BUT THE LANDER IS ANOTHER MATTER.

THERE'S NO TIME TO SOLVE ALL ITS TECHNICAL PROBLEMS.

I'M SENSING SOME LACK OF CONFIDENCE IN THE 2001 LANDER.



April 7, 2001

IN THE END, THE ORBITER, ODYSSEY, LAUNCHES...



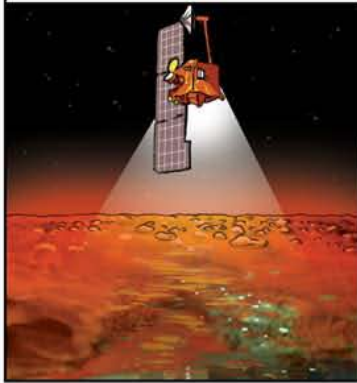
...BUT THE LANDER REMAINS BEHIND, STORED AT LOCKHEED MARTIN.

2002

BOYNTON IS PRINCIPAL INVESTIGATOR FOR ODYSSEY'S GAMMA RAY SPECTROMETER EXPERIMENT, WHICH HE FIRST TRIED TO RUN ON THE OBSERVER.



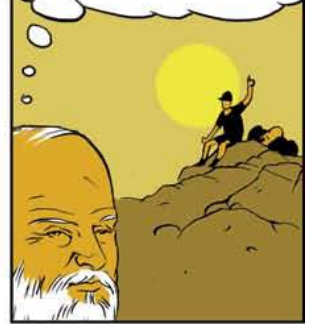
THE INSTRUMENT SEARCHES FOR EVIDENCE OF WATER AND ICE IN MARTIAN SOIL.



SO MUCH HYDROGEN. THIS COULD MEAN HUGE QUANTITIES OF ICE.

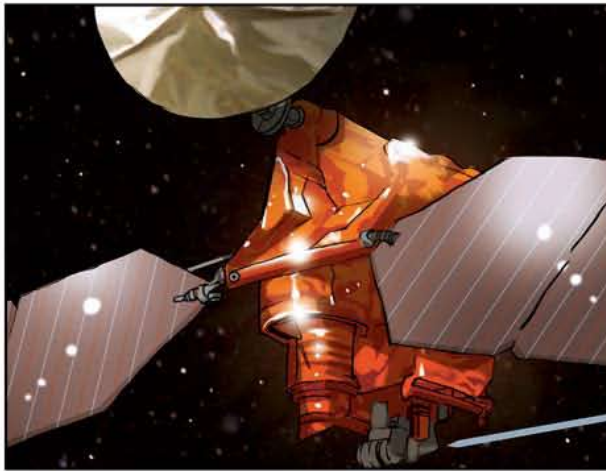
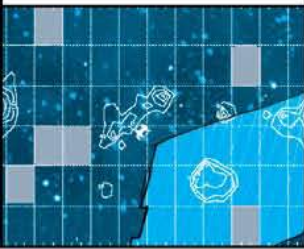


AFTER ALL THESE DISAPPOINTMENTS, IT'S HARD TO DESCRIBE WHAT IT'S LIKE TO GET DATA. THE JOY MORE THAN MAKES UP FOR THE LOSSES.

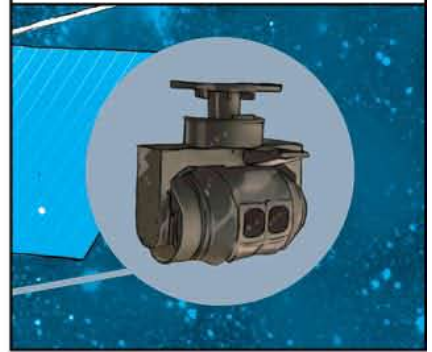


March 10, 2006

PAIGE, MCCLEESE, AND ZUREK HAVE GONE ON TO WORK ON THE MARS RECONNAISSANCE ORBITER, WHICH WILL STUDY THE HISTORY OF WATER ON MARS AND SCOUT FUTURE LANDING SITES.



THE SPACECRAFT CARRIES THE CLIMATE SOUNDER, HEIR TO THE PMRR INSTRUMENTS LOST WITH CLIMATE ORBITER AND OBSERVER.



IT SUCCESSFULLY REACHES ORBIT...



...AND THE SCIENTISTS GET DATA TO WORK WITH.

BUT NOT EVERYONE HAS LET GO OF THE LANDER.



ODYSSEY AND MARS RECONNAISSANCE ORBITER ARE SUCCESSES.



AND THE ROVER MISSIONS SPIRIT AND OPPORTUNITY, LAUNCHED IN 2003, HAVE REVEALED A GREAT DEAL ABOUT THE SURFACE OF THE RED PLANET.



2005

PETER SMITH, PRINCIPAL INVESTIGATOR, PHOENIX POLAR MISSION



TO SEE THE NORTH POLE—SUCH AN INCREDIBLE, ALIEN-LOOKING LANDSCAPE.

BUT ANOTHER OPPORTUNITY IS COMING UP TO LAND IN A POLAR REGION, AND PETER SMITH PROPOSES THE PHOENIX MISSION, WHICH WOULD RESUSCITATE THE 2001 LANDER AND RETRY SOME EXPERIMENTS PLANNED FOR THE LOST POLAR LANDER.



IT COSTS \$10,000 JUST TO OPEN THE BOX.



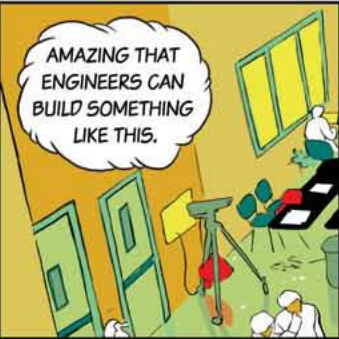
BUT I HAVE TO SEE IF THE 2001 LANDER IS SOMETHING WE CAN REVIVE.



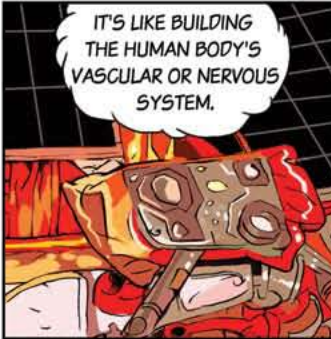
FIFTEEN YEARS OF DEVELOPMENT—WE CAN'T WASTE THAT.



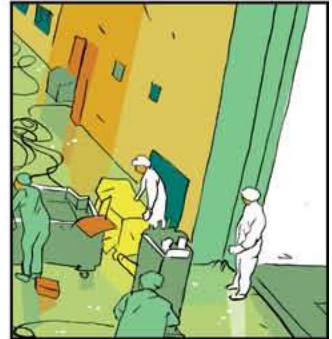
SUCH A BEAUTIFUL SPACECRAFT.



AMAZING THAT ENGINEERS CAN BUILD SOMETHING LIKE THIS.



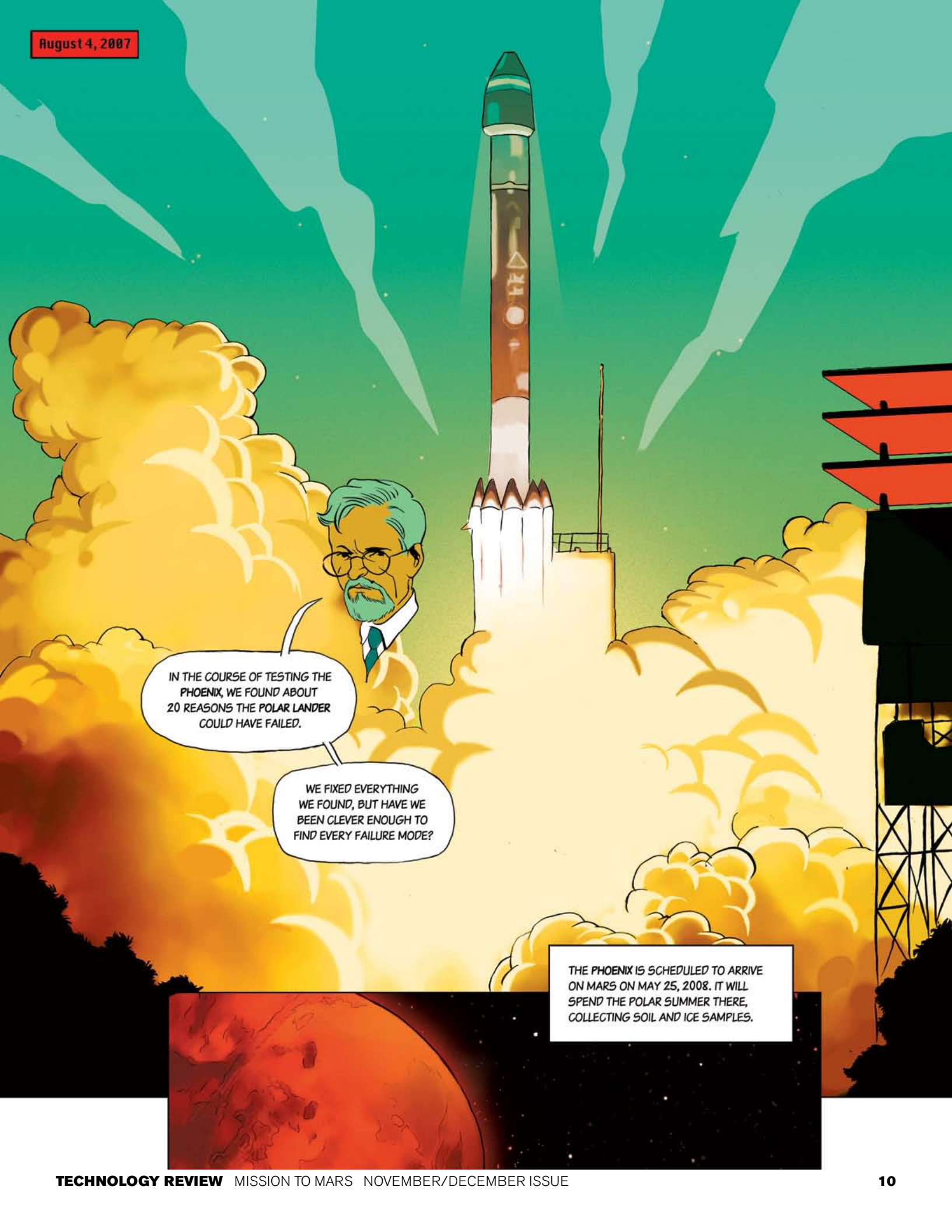
IT'S LIKE BUILDING THE HUMAN BODY'S VASCULAR OR NERVOUS SYSTEM.



OUR JOB NOW IS TO FIND ITS FLAWS. AND FIX THEM.



THE PHOENIX RISING FROM THE ASHES OF THE 2001 LANDER AND THE POLAR LANDER BEFORE IT.



IN THE COURSE OF TESTING THE PHOENIX, WE FOUND ABOUT 20 REASONS THE POLAR LANDER COULD HAVE FAILED.

WE FIXED EVERYTHING WE FOUND, BUT HAVE WE BEEN CLEVER ENOUGH TO FIND EVERY FAILURE MODE?

THE PHOENIX IS SCHEDULED TO ARRIVE ON MARS ON MAY 25, 2008. IT WILL SPEND THE POLAR SUMMER THERE, COLLECTING SOIL AND ICE SAMPLES.