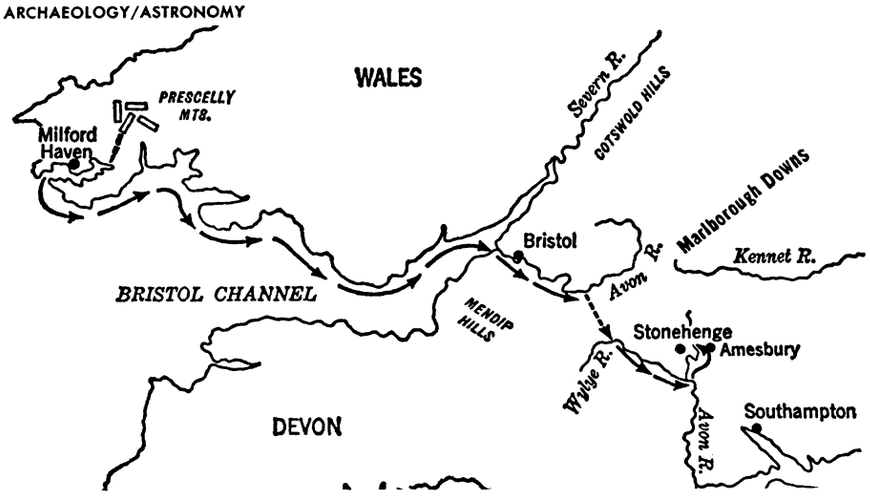


Probable route of stones to Stonehenge, England.

Stonehenge Revisited

by Barbara Tufty

Each morning after the longest night of winter, for the past 3,500 years, the rays of the returning sun burst above the horizon and shine with remarkable accuracy through two stone arches of ancient mystical Stonehenge.

Suddenly at 7:29 on Thursday morning, Dec. 22, the first ray of the winter solstice sun will flash above the dark icy horizon of the stone circle in southern England. It will signal the imminence of Christmas and set off another season of violent controversy, hottest it has been in the past 50 years.

At that instant, as on certain other times in solar and lunar cycles, a gathering of people may greet the event on the lonely windswept plain of Salisbury—and spend the next several days, weeks or even years in arguing the freshly kindled dispute, or in brooding quietly over the deep emotions these ancient, inscrutable stones evoke.

At dawn of Dec. 22, the rays of the rising sun will fall this year, as they have since about 1600 B.C., directly through a long narrow slit formed by two aligned stone archways (cover)—one arch of the immense sunrise trilithon composed of three stones about 20 feet high and weighing an average 50 tons each, and the other archway in a ring of large 30-ton stones known as the sarsen circle.

Some of the archways are perplexingly narrow—so small an adult cannot pass between them. When a person looks through two aligned archways, the view is restricted to a very small slit, as tightly controlled and directed as a gunsight.

What could prehistoric men in the dim misty ages have been wanting to see at this dark wintry hour? They were waiting then, as people wait now, to catch the first ray of the rising sun when it is at its farthest point south. These ancient astronomers must have known, as we know now, that from that moment on, the Northern Hemisphere will gradually receive more light each day as the sun slowly returns to the frozen north.

Yet how could men of the Stone Age, who had not yet invented a wheel or hammered a metal instrument, have had the intelligence to capture this moment, and other astronomical moments even more obscure and precise, with the one material they knew—stone? Many modern men have pondered this question and tried to fathom the pattern and use of that mysterious group of stones called Stonehenge—Britain's unique monument, and one of the largest megalithic monuments in the world.

Essentially the monument is a series of concentric circles of stones, holes and mounds. In the center bluestones are set in the shape of a horseshoe, surrounded by five trilithons, or rugged three-stone arches. Then follow circles of bluestones, large arches of sarsen stones, "Y" and "Z" holes, the 56 "Aubrey holes" and rings of two earthern banks and a ditch, completing an outer circle some 350 feet in diameter. The 56 holes, originally called "X," are named for John Aubrey, 17th century archaeologist.

Part of the Stonehenge story, as pieced together by archaeologists, geologists and historians, is this: over a period of perhaps 300 years, from about 1900 to 1600 B.C., men of the late Stone Age in Britain, designed the circular plan and dragged enormous sarsen stones from more than 20 miles away. Since some of these stones weighed nearly 50 tons, it may have taken 800 to 1,000 men to pull each piece—probably using rawhide, since they had no rope. The bluestones were hauled and floated from Wales, 215 miles distant.

These men left little record as to who they were, why they worked so hard to set up the stones, or how they used them. For centuries, scientists calculated and deduced, and poets and writers wove myths and legends. Strange, imaginative and not too accurate tales evolved, including sun and serpent worship, human sacrifices, white-robed Druids and stern-faced Romans.

Suddenly, in less time than it takes the sun to rise above the horizon, a new theory from an astronomer stirred up ancient arguments and new emotions over Stonehenge. With the use of one minute's time of an International Business Machines Corporation's 7090 computer—after months of patient planning and programming—astronomer Dr. Gerald S. Hawkins of Harvard College Observatory in 1963 superimposed some of the 27,060 possible alignments made by pairing 165 positions of Stonehenge's stones, holes and mounds upon calculations of astronomical events adjusted to the year 1500 B.C.

The remarkable results of these calculations produced 32 alignments of Stonehenge objects toward significant positions of the moon and sun—results apparently not achievable by chance.

Because of this remarkable alignment pattern and the Aubrey holes, Dr. Hawkins believes the momument was actually an immense outdoor observatory and "computer" designed by prehistoric men with advanced logic to calculate intricate eclipses of the moon for 350 years, as well as seasonal variations of the sun and moon.

Reaction to this new theory was swift and mixed—breathless acceptance from the general public and compound reactions of shock and grudging to enthusiastic acceptance from scientists. The debate grows in intensity as time passes.

Some British scientists, headed by that country's foremost authority of Stonehenge, Dr. R. J. C. Atkinson of University College in Cardiff, Wales, have objected to Dr. Hawkins' theory on the grounds that people of that era could not have been sufficiently advanced to construct such a computer.

Also, they have taken Dr. Hawkins to task on some of his inexact archaeological measurements.

Yet one of Britain's famed astronomers, Dr. Fred Hoyle, has recently supported Dr. Hawkins' deduction and even said he did not go far enough —perhaps the early Englishmen were moon worshippers with refined calculations of the moon's fluctuations well defined in stone.

All in all, the present raging controversy is, as one authority said, a "good healthy battle" of archaeology versus astronomy, of television debates, emotional articles, radio broadcasts and letters—a fight in which everyone from street cleaner to banker to politician may feel emotionally involved. This is the first real stir in the last 50 years involving that desolate plain of Salisbury, which the British have taken great pains to preserve. Many economic battles have been fought and won to prevent real estate and other interests from destroying the immense sense of space and wonder one feels among the rocks of Stonehenge, bounded only by flat chalk plains upon which no tree grows for miles, and over which brood gray cloud-scudded skies.

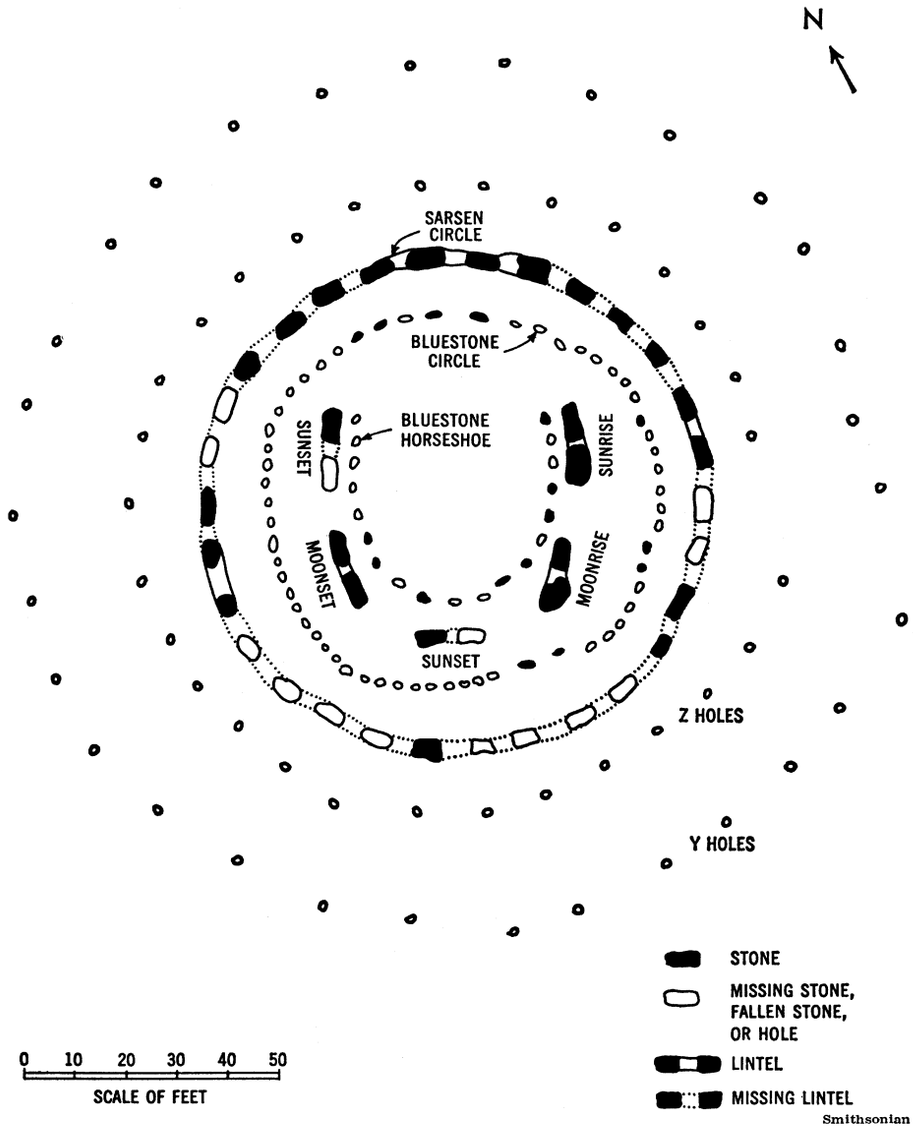
Stonehenge has long been recognized as oriented to the midsummer sunrise, when the sun's rays pour over the Hele stone to light on the misnamed "altar stone."

Now men are realizing that Stonehenge may be also aligned to the rising, setting and eclipses of the moon, as well as the sun. One of Dr. Hawkins' most startling theories is that of the 56 Aubrey holes, which vary from two and a half to six feet in diameter, that encircle the monument. With a system of stones to be shifted from one hole to the next each year, Dr. Hawkins maintains that the early Stonehenge builders could have calculated and forecast for periods of 350 years the lunar eclipses that average out at intervals of 19, 19 and 18 years —a cycle of 56 years.

The rhythmic motions of the sun and moon through the sky have long been observed by the more objective and thinking people of ancient civilizations, and are now calculated using some of the world's most precise instruments.

On Dec. 22 of this year, the sun's rays will fall directly upon the farthermost point south, the Tropic of Capricorn, at precisely 2:29 a.m., EST, at a spot 67 degrees and 21 minutes east longitude—the middle of the Indian Ocean. This is the moment the Southern Hemisphere is steeped in direct sunlight, and summer falls upon that part of the world.

Yet the Northern Hemisphere lies in winter darkness. Birds have long since flown south; most insects are dead from the cold or hang suspended in sacks under leaves or cracks of tree bark. Hedgehogs, ground squirrels and other marmots lie underground in the tranquil state of hibernation, and bears lie curled in long drowsy sleep. Now the sun rises late with a brassy color, devoid of warmth, skimming low over the horizon and setting soon behind dark dreary hills. Trees stand stark and strangely quiet in snow-filled woods; fields are gripped in cold; great rivers stand locked in ice. Life now seems at its lowest ebb.



Reconstructed plan of Stonehenge, as calculated by archaeologists.

Ancient people used to fear this time of year, thinking the sun might keep on receding over the horizon and never return. Fearfully they offered sacrifices to appease the sun god, and built bright bonfires to encourage his return—and to lift up their own spirits.

Then, as the astronomer-priests had known from their crude but accurate instruments, at a certain time the sun would start a slow but sure return. Then would come a time of joyful celebrations, woven around ancient legends—the Persians designated Dec. 25 as the birthday of their sun god, Mithras, who emerged from a rock three days after the darkest day of the year. In ice-bound Scandinavia, the Norse god of sun, young Balder, slain by mistletoe, revived upon the third day and spread his light over the world. Following the basic pattern of nature, the Christian Church selected that same wondrous day as the birthday of Christ, reflecting the rejoicing of people in the return of light, warmth and hope.

(*Cover picture—CBS.*)