

Ode On A Grecian Urn

I.

Thou still unravish'd bride of quietness,
Thou foster-child of silence and slow time,
Sylvan historian, who canst thus express
A flowery tale more sweetly than our rhyme:
What leaf-fring'd legend haunts about thy shape 5
Of deities or mortals, or of both,
In Tempe or the dales of Arcady?
What men or gods are these? What maidens loth?
What mad pursuit? What struggle to escape?
What pipes and timbrels? What wild ecstasy? 10

II.

Heard melodies are sweet, but those unheard
Are sweeter; therefore, ye soft pipes, play on;
Not to the sensual ear, but, more endear'd,
Pipe to the spirit ditties of no tone:
Fair youth, beneath the trees, thou canst not leave 15
Thy song, nor ever can those trees be bare;
Bold Lover, never, never canst thou kiss,
Though winning near the goal — yet, do not grieve;
She cannot fade, though thou hast not thy bliss,
For ever wilt thou love, and she be fair! 20

III.

Ah, happy, happy boughs! that cannot shed
Your leaves, nor ever bid the Spring adieu;
And, happy melodist, unwearied,
For ever piping songs for ever new;
More happy love! more happy, happy love! 25
For ever warm and still to be enjoy'd,
For ever panting, and for ever young;
All breathing human passion far above,
That leaves a heart high-sorrowful and cloy'd,
A burning forehead, and a parching tongue. 30

IV.

Who are these coming to the sacrifice?
To what green altar, O mysterious priest,
Lead'st thou that heifer lowing at the skies,
And all her silken flanks with garlands drest?
What little town by river or sea shore, 35
Or mountain-built with peaceful citadel,

Is emptied of this folk, this pious morn?
And, little town, thy streets for evermore
Will silent be; and not a soul to tell
Why thou art desolate, can e'er return. 40

V.

O Attic shape! Fair attitude! with brede
Of marble men and maidens overwrought,
With forest branches and the trodden weed;
Thou, silent form, dost tease us out of thought
As doth eternity: Cold Pastoral! 45
When old age shall this generation waste,
Thou shalt remain, in midst of other woe
Than ours, a friend to man, to whom thou say'st,
"Beauty is truth, truth beauty," —that is all
Ye know on earth, and all ye need to know." 50

John KEATS, 1820

The Poetical Works of John Keats, Edited by H. Buxton Forman, Oxford University Press
1953 (1908).

5 Another prediction of general relativity is that time should appear to run slower near a massive body like the earth. [...] To someone high up, it would appear that everything down below was taking longer to happen. This prediction was tested in 1962, using a pair of very accurate clocks mounted at the top and bottom of a water tower. The clock at the bottom, which was nearer the earth, was found to run slower, in exact agreement with general
10 relativity. The difference in speed of clocks at different heights above the earth is now of considerable practical importance, with the advent of very accurate navigation systems based on signals from satellites. If one ignored the predictions of general relativity, the position that one calculated would be wrong by several miles!

15 Newton's laws of motion put an end to the idea of absolute position in space. The theory of relativity gets rid of absolute time. Consider a pair of twins. Suppose that one twin goes to live on the top of a mountain while the other stays at sea level. The first twin would age faster than the second. Thus, if they met again, one would be older than the other. In this case, the difference in ages would be very small, but it would be much larger if one of the twins went for a long trip in a spaceship at nearly the speed of light. When he returned, he
20 would be much younger than the one who stayed on earth. This is known as the twins paradox, but it is a paradox only if one has the idea of absolute time at the back of one's mind. In the theory of relativity there is no unique absolute time, but instead each individual has his own personal measure of time that depends on where he is and how he is moving.

25 Before 1915, space and time were thought of as a fixed arena in which events took place, but which was not affected by what happened in it. This was true even of the special theory of relativity. Bodies moved, forces attracted and repelled, but time and space simply continued, unaffected. It was natural to think that space and time went on forever.

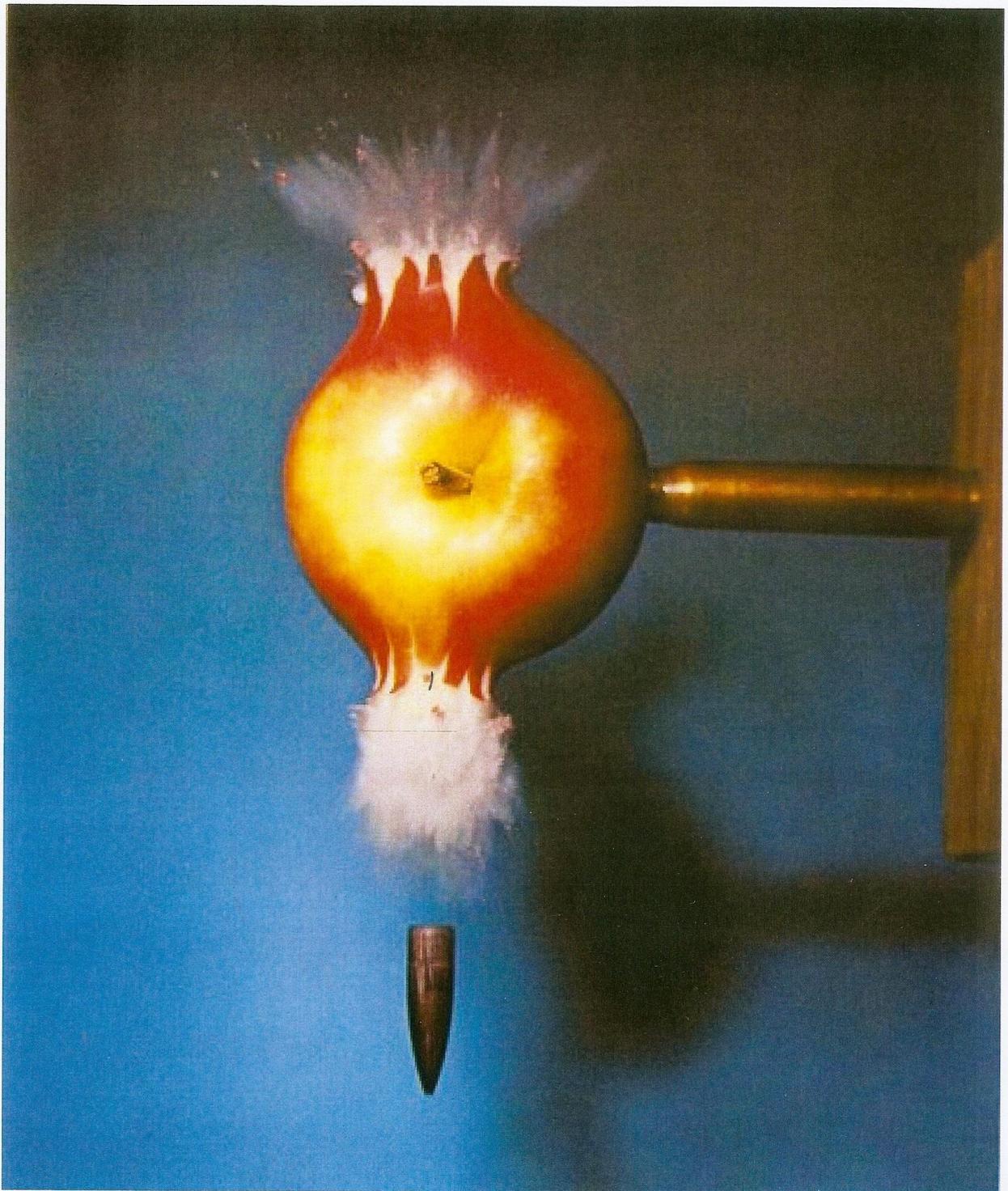
30 The situation, however, is quite different in the general theory of relativity. Space and time are now dynamic quantities: when a body moves, or a force acts, it affects the curvature of space and time—and in turn the structure of space-time affects the way bodies move and forces act. Space and time not only affect but also are affected by everything that happens in the universe. Just as one cannot talk about events in the universe without the notions of space and time, so in general relativity it became meaningless to talk about space and time outside the limits of the universe.

35 In the following decades this new understanding of space and time was to revolutionize our view of the universe. The old idea of an essentially unchanging universe that could have existed, and could continue to exist, forever was replaced by the notion of a dynamic, expanding universe that seemed to have begun a finite time ago, and that might end at a finite time in the future. That revolution forms the subject of the next chapter. And years
40 later, it was also to be the starting point for my work in theoretical physics. Roger Penrose and I showed that Einstein's general theory of relativity implied that the universe must have a beginning and, possibly, an end.

45 Stephen HAWKING. *A Brief History of Time. From the Big Bang to Black Holes*. New York, 1988.

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Harold Edgerton "Shooting the Apple", 1964, photograph



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