
841.00 **Foldability Sequence**

841.11 Using the method of establishing perpendiculars produced by the overlapping of unit-radius circles in the first instance of the Greeks' exclusively one-planar initiation of their geometry (see Illus. 455.11), a diameter PP' perpendicular to the first straightedge constructed diameter DD' can be constructed. If we now fold the paper circles around DD' and PP', it will be found that every time the circles are folded, the points where the perpendicular to that diameter intercept the perimeter are inherently congruent with the same perpendicular's diametrically opposite end.

841.12 The succession of positive and negative foldings in respect to the original plane folded around a plurality of diameters of that plane will define a sphere with inherent poles P and P', which occur at the point of crossing of the rotated perpendiculars to the folded-upon diameters, the PP' points being commonly equidistant from the first prime, as yet unfolded circle cut out from the first piece of paper. This constructional development gives us a sphere with a polar axis PP' perpendicular to the original plane's circle at the center of that circle. We can also fold six great circles of unit radius, first into half-circle, 180-degree-arc units, and then halve-fold those six into 90-degree "bookends," and assemble them into a spherical octahedron with three axes, and we can rotate the octahedron around axis PP' and thus generate a spherical surface of uniform radii.

841.13 We could also have constructed the same sphere by keeping point A of the dividers at one locus in Universe and swinging point B in a multiplicity of directions around A (see Illus. 841.15). We now know that every point on the surface of an approximate sphere is equidistant from the same center. We can now move point A of the dividers from the center of the constructed sphere to any point on the surface of the sphere, but preferably to point P perpendicular to an equatorially described plane as in

841.11 and 841.12 . And we can swing the free point B to strike a circle on the surface of the sphere around point P. Every point in the spherical surface circle scribed by B is equidistant chordally from A, which is pivotally located at P, that is, as an apparently straight line from A passing into and through the inside of the spherical surface to emerge again exactly in the surface circle struck by B, which unitary chordal distance is, by construction, the same length as the radius of the sphere, for the opening of our divider's ends with which we constructed the sphere was the same when striking the surface circle around surface point A.

841.14 We now select any point on the spherical surface circle scribed by point B of the dividers welded at its original radius-generating distance with which we are conducting all our exploration of the spheres and circles of this operational geometry. With point A of the dividers at the north-polar apex, P', of the spherical octahedron's surface, which was generated by rotating the symmetrical assembly of six 90-degree, quadrangularly folded paper circles. Axis PP' is one of its three rectilinearly interacting axes as already constructively described.

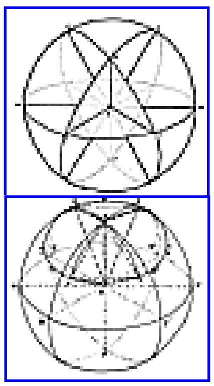

Fig. 841.15A
Fig. 841.15B

841.15 We now take any point, J, on the spherical surface circle scribed by the divider's point B around its rotated point at P. We now know that K is equidistant chordally from P and from the center of the sphere. With point A of our dividers on J, we strike point K on the same surface circle as J, which makes J equidistant from K, P, and X, the center of the sphere. Now we know by construction integrity that the spherical radii XJ, XK, and XP are the same length as one another and as the spherical chords PK, JK, and JP. These six equilength lines interlink the four points X, P, J, and K to form the regular equiedged tetrahedron. We now take our straightedge and run it chordally from point J to another point on the same surface circle on which JK and K are situated, but diametrically opposite K. This diametric positioning is attained by having the chord- describing straightedge run inwardly of the sphere and pass through the axis PP', emerging from the sphere at the surface-greatcircle point R. With point A of the dividers on point R of the surface circle—on which also lies diametrically point K—we swing point B of the dividers to strike point S also on the same spherical surface circle around P, on which now lie also the points J, K and R, with points diametrically opposite J, as is known by construction derived information. Points R, S, P, and X now describe another regular tetrahedron equiedged with tetrahedron JKPX; there is one common edge, PX, of both tetrahedra. PX is the radius of the

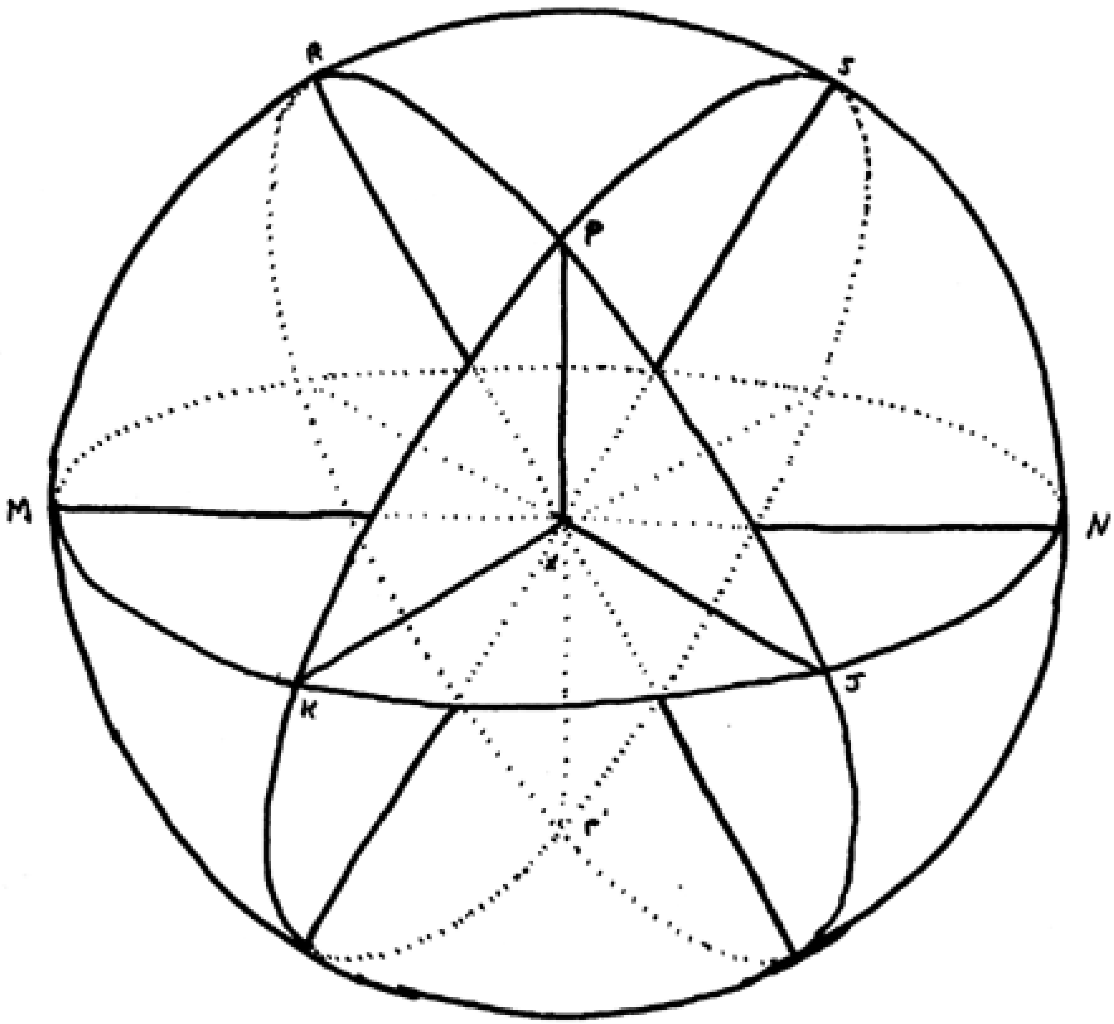

Fig. 841.15A Realization of Four Great Circles of Vector Equilibrium.

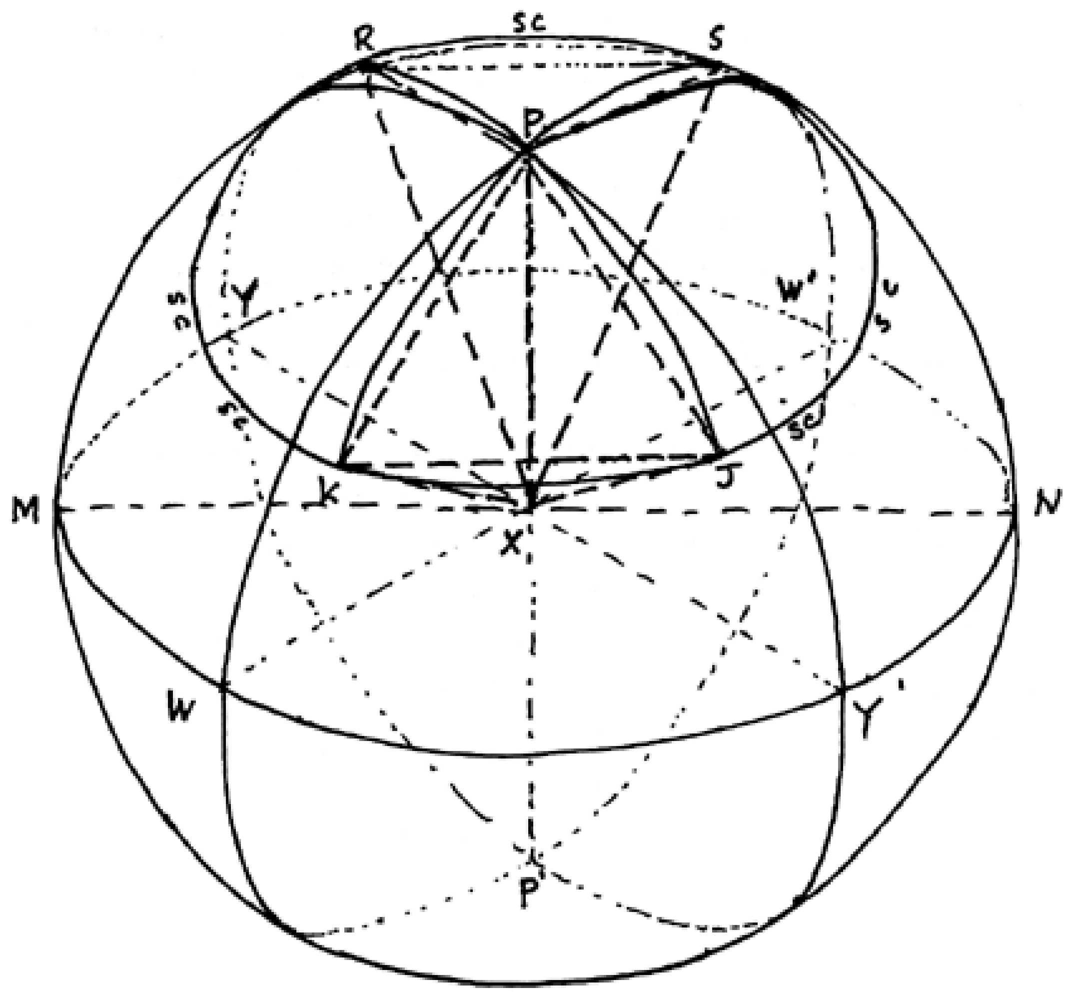

Fig. 841.15B Fixed Radius Striking a Small Circle on the Surface of a Sphere.

spherical, octahedrally constructed sphere on whose surface the circle was struck around one of its three perpendicularly intersectioned axes, and the three planes through them intersect congruently with the three axes by construction. PX is perpendicular to the equatorial plane passing through W, Y, W', Y' of the spherical octahedron's three axes PP', WW', and YY'.

841.16 We may now take the congruent radius edge PX of the two tetrahedra and separate it into the two radii $(PX)^1$ and $(PX)^2$ and rotate their two P ends (PM) and (PN), away from one another around the sphere's center, X, until (PM) and (PX) are diametrically opposite one another. Therefore, points (PM) and (PN) are now lying in the octahedron's equatorial plane WXW'Y'. We may now rotate points J, K, R, and S around the (PM), X (PN) axis until points J, K, R, and S all lie in the octahedral plane WY W'X', which converts the opened unitary construction first into a semifolded circle and then into a circle congruent with the octahedron's equatorial plane, all of which six-hinged transformation was permitted as all the seven points—(PM), J, K, (PN), S, R, X—were at all times equidistant from one another, with no restraints placed on the motion. We now have the hexagonally divided circle as a constructionally proven geometrical relationship; and therefore we have what the Greeks could not acquire: i.e., a trisected 180-degree angle; ergo a six-equiangular subdivision of spherical unity's 360 degrees into 60-degree omniequiangularity; ergo a geometrically proven isotropic vector matrix operational evolvement field.

841.17 With our operationally considerate four tools of divider, straightedge and scriber and measurably manipulable scribable system as a material object (in this case, a sheet of paper; later, four sheets of paper), and with our constructionally proven symmetrical subdivision of a circle into six equilateral triangles and their six chord- enclosed segments, we now know that all the angles of the six equilateral triangles around center X are of 60 degrees; ergo, the six triangles are also equiangular. We know that the six circumferential chords are equal in length to the six radii. This makes it possible to equate rationally *angular* and *linear* accelerations, using the unit-radius chord length as the energy-vector module of all physical-energy accelerations. We know that any one of the 12 lines of the equilaterally triangled circle are always either in 180-degree extension of, or are parallel to, three other lines. We may now take four of these hexagonally divided circles of paper. All four circular pieces of paper are colored differently and have different colors on their opposite faces; wherefore, there are eight circular faces in eight colors paired in opposite faces, e.g., red and orange, yellow and green, blue and violet, black and white.

841.18 We will now take the red-orange opposite-faced construction-paper circle. We fold it first on its (PM)-(PN) axis so that the red is hidden inside and we see only an orange half-circle's two-ply surface. We next unfold it again, leaving the first fold as a crease. Next we fold the circle on its RX axis so that the orange face is inside and the red is outside the two-ply, half-circled foldup. We unfold again, leaving two crossing, axially folded creases in the paper. We next fold the same paper circle once more, this time along its JS axis in such a manner that the orange is inside and once again only the red surface is visible, which is the two-ply, half-circle folded condition.

841.19 We now unfold the red-orange opposite-faced colored-paper circle, leaving two positive and one negative creases in it. We will find that the circle of paper is now inclined by its creases to take the shape of a double tetrahedron bow tie, as seen from its openings end with the orange on the inside and the red on the outside. We may now insert a bobby pin between points (PM) and (PN), converting this hexagonally subdivided and positively—negatively folded circle back into the mutually congruent PX edge, two (hinge-bonded, bivalent) tetrahedra: JKPX and RSPX.

841.20 We may now fold the other three circles into similar, edge-bonded, tetrahedral bow-tie constructions in such a manner that number two is yellow outside and green inside; number three of the 60-degree-folded bow ties is blue outside and violet inside; and the fourth bow tie, identical to the other three bow ties' geometrical aspects of 60-degree equiangularity and equiradius chord edges, is black outside and white inside.

841.21 We may take any two of these bow ties—say, the orange inside and the green inside—and fasten each of their outside corners with bobby pins, all of their radii being equal and their hinges accommodating the interlinkage.

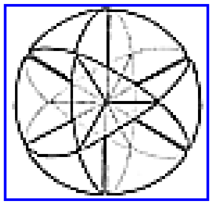

Fig. 841.22

841.22 Each of these paired bow-tie assemblies, the orange-green insiders and the violet-white insiders, may now be fastened bottom-to-bottom to each other at the four external fold ends of the fold cross on their bottoms, with those radial crosses inherently congruent. This will reestablish and manifest each of the four original circles of paper, for when assembled symmetrically around their common center, they will be seen to be constituted of four great circles intersecting each other through a common center in such a manner that only two circular planes come together at any other than their common center point and in such a manner that each great circle is divided entirely into six equilateral triangular areas, with all of the 12 radii of the system equilengthed to the 24 circumferential chords of the assembly. Inasmuch as each of the 12 radii is shared by two great circle planes, but their 24 external chords are independent of the others, the seeming loss of 12 radii of the original 24 is accounted for by the 12 sets of congruent pairs of radii of the respective four hexagonally subdivided great circles. This omniequal line and angle assembly, which is called the vector equilibrium, and its radii-chord vectors accommodate rationally and simultaneously all the angular and linear acceleration forces of physical Universe experiences.

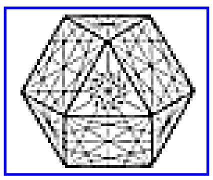

Fig. 841.30

841.30 **Trisection by Inherent Axial Spin of Systems**

841.31 The 12 great circles of the vector equilibrium's hemispherical self-halvings inherently—and inadvertently—centrally *trisect* each of the vector equilibrium's eight equiangle spherical triangles, centrally subdividing those triangles into twelve 30-degree angles.

842.00 **Generation of Bow Ties**

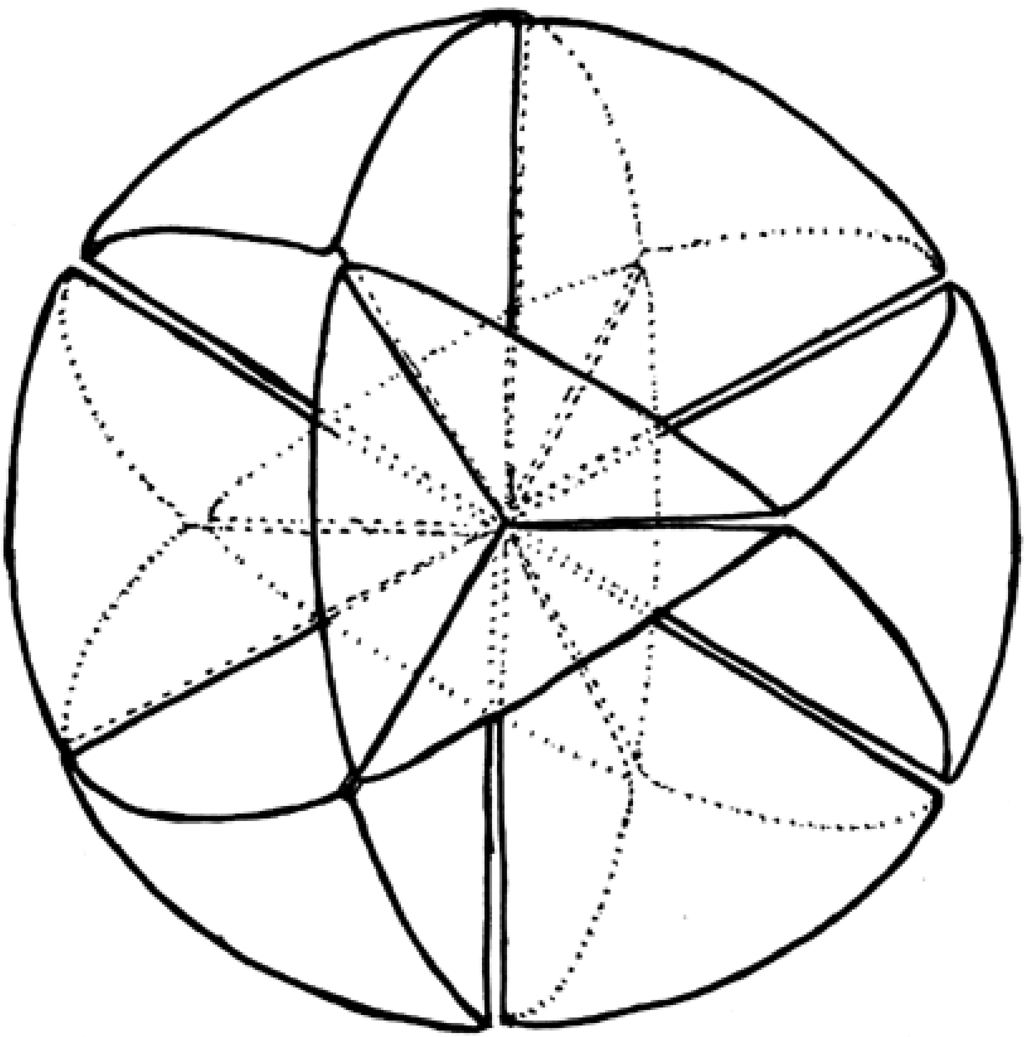

Fig. 841.22 Foldability of Four Great Circles of Vector Equilibrium.

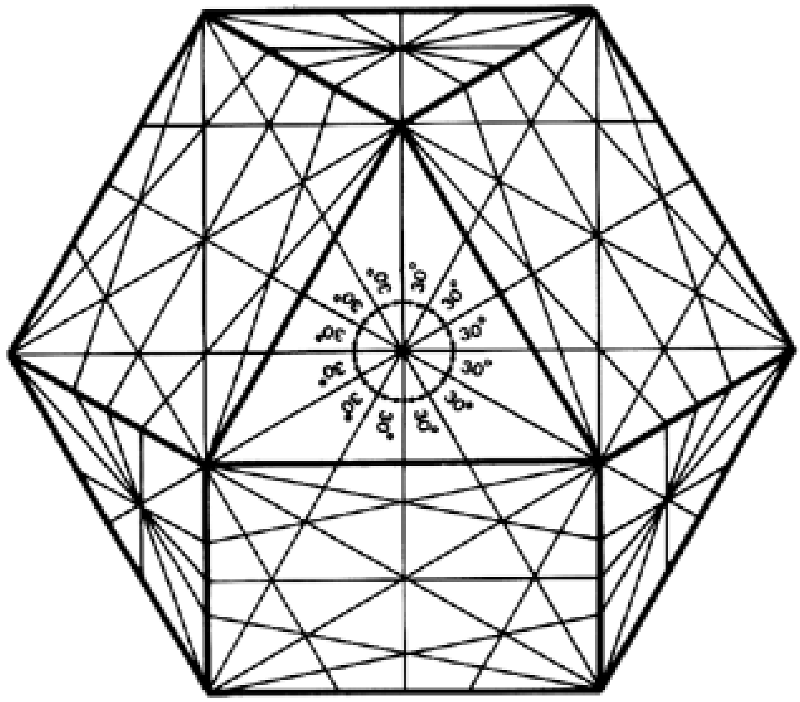

Fig. 841.30 Trisection by Inherent Axial Spin: The 12 great circles of the vector equilibrium inherently trisect each of its eight equiangular faces, centrally subdividing each of them into twelve 30-degree angles.

842.01 When we consider the "jitterbug" vector equilibrium contracting into the icosahedron, bearing in mind that it is all double-bonded, we discover that, when the jitterbug gets to the octahedron phase, there really are two octahedra there.... Just as when you get three great circles, each one is doubled so that there are really six.... In making my tests, taking whole great circles of paper, doing my spherical trigonometry, learning the central angles, making those bow ties as a complex, which really amounts to tetrahedra bonded edge-to-edge with a common center, they link up as a chain and finally come together to make the icosahedron in a very asymmetrical manner. The 10, 12, and 15 great circles re-establish themselves, and every one of them can be folded.

842.02 You cannot make a spherical octahedron or a spherical tetrahedron by itself. You can make a spherical cube with two spherical tetrahedra in the pattern of the six great circles of the vector equilibrium. It becomes a symmetrically triangulated cube. In fact, the cube is not structurally stabilized until each of its six unstable, square-based, pyramidal half-octahedra are subdivided respectively into two tetrahedra, because one tetrahedron takes care of only four of the eight vertexes. For a cube to be triangulated, it has to have two tetrahedra.

842.03 There is no way to make a single spherical tetrahedron: its 109° 28' of angle cannot be broken up into 360-degree-totaling spherical increments. The tetrahedron, like the octahedron, can be done only with two tetrahedra in conjunction with the spherical cube in the pattern of the six great circles of the vector equilibrium.

842.04 Nor can we project the spherical octahedron by folding three whole great circles. The only way you can make the spherical octahedron is by making the six great circles with all the edges double—exactly as you have them in the vector equilibrium—as a strutted edge and then it contracts and becomes the octahedron.

842.05 There is a basic cosmic sixness of the two sets of tetrahedra in the vector equilibrium. There is a basic cosmic sixness also in an octahedron minimally-great-circle- produced of six great circles; you can see only three because they are doubled up. And there are also the six great circles occurring in the icosahedron. All these are foldable of six great circles which can be made out of foldable disks.

842.06 This sixness corresponds to our six quanta: our six vectors that make one quantum.

842.07 There are any number of ways in which the energy can go into the figure-eight bow ties or around the great circle. The foldability reveals holdings patterns of energy where the energy can go into local circuits or go through the points of contact. One light year is six trillion miles, and humans see Andromeda with naked eye one million light years away, which means six quintillion miles. You can reflect philosophically on some of the things touch does, like making people want to get their hands on the coin, the key, or whatever it may be. This is a typical illustration of total energy accounting, which all society must become conversant with in short order if we are to pass through the crisis and flourish upon our planet. If we do succeed, it will be because, among other planetary events, humans will have come to recognize that the common wealth equating accounting must be one that locks fundamental and central energy incrementations-such as kilowatt hours-to human physical-energy work capability and its augmentation by the mind- comprehending employability of generalized principles of Universe, as these may be realistically appraised in the terms of increasing numbers of days for increasing numbers of lives we are thus far technically organized to cope with, while accommodating increasing hours and distances of increasing freedoms for increasing numbers of human beings. All of this fundamental data can be introduced into world computer memories, which can approximately instantly enlighten world humanity on its increasingly more effective options of evolutionary cooperation and fundamentally spontaneous social commitment.

Next Chapter: 900.00
