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What I Learned from Karl Popper: An Interview with E. H. Gombrich

interview conducted by Paul Levinson

I met with Sir Ernst Gombrich in New York City on October 14, 1979, to discuss how his thinking about art and related topics had benefited from his long friendship with Karl Popper, and his exposure to Popper's ideas. We sat in the apartment of the late Dr. Marianne Kris, which, with its walls hung with paintings and etchings, and its location overlooking Central Park, provided good points of reference for two of the main subjects of our conversation—art and the natural world. What follows is a more or less verbatim transcript of the interview, revised only slightly for style and not at all for content, and with section titles added by me later.—P.L.

PL: Why don't we start by looking at this question: Karl Popper is known primarily as a philosopher of science, and as a social philosopher, and more recently as a philosopher of biology. How does someone such as yourself, whose expertise and whose life's work has been in the area of art and aesthetics, find Popper's work of so much value?

EHG: Well, I think we must start at the other end—we have been friends for very, very many years, and very close friends. We met first in '36 in London, but I had also fleetingly met him in Vienna too, and I knew of his work while I was studying in Vienna. And it so happens that my father, who was a lawyer, was apprenticed to his father, who was a lawyer, so the families had always known of each other. I have always had philosophical interests, and therefore it is not so surprising that when Popper came to London and we spent a good deal of time together, we also talked of philosophy. That is really one aspect of the matter.

The other aspect is that aesthetics is not really one of my main interests—I see myself much more as a historian than as a critic or aesthetician. And a historian, of course, is inevitably concerned with the problems of knowledge, of doubt, of theories, of the way theories are guided by questions and all these matters. So that Popper's ideas were not all that strange to me. You may remember that I contributed to the Schilpp volume ["The Logic of Vanity Fair," in *The Philosophy of Karl Popper*, ed. P. A. Schilpp (LaSalle, III.: Open Court, 1974), pp. 925-957], and I mention there that I attended Hayek's seminar [at the London School of Economics] when Karl Popper read his paper on the poverty of historicism, which naturally interested me very much because I had been very skeptical of the sort of Hegelian approach to the history of art. And we talked a good deal about that too, but we talked of many other things as well.

You mentioned, incidentally, that Popper is mainly known as a philosopher of science, which is true; but after all, his book *The Open Society* [*The Open Society and Its Enemies* (London: Routledge &

Kegan Paul, 1945)], is largely also a work of scholarship about the ancient world, so he is also a historian.

Art History and Historicism

PL: Well, let's talk a bit about Popper's and your view of history. You mentioned your disagreement with Hegel, and of course Popper is well known for his disagreement with Hegel.

EHG: Yes.

PL: And yet there is some similarity, perhaps superficial, between Popper's and Hegel's works—even Popper's view of Worlds 1, 2, and 3 bears a certain resemblance to Hegel's three-part system—so what would be the main area of Hegel's work that you so strongly disagreed with? Was it the historicism issue—the idea that there are "moving spirits" throughout history?

EHG: Yes, that is one of the main points. But Hegel is, after all, an "ontologist," if one could use this term—I mean he really believed that he knew about the plans of the "Absolute," the way the Absolute evolved in history, and he thought that he himself was something like the mouthpiece of the Absolute. So there's a great deal of difference—I mean, the number "three" is not a monopoly of either Hegel or Popper, and I don't think the similarity is very great.

It is true that Popper's idea of World 3, as he has said himself, bears some superficial resemblance to the Objective Spirit. Of course nobody who has been brought up in these traditions of German idealism can have escaped problems of this kind, which also may have directed Popper's thought—though Popper was a very keen student of *Kant*, and spent a great deal of time in his early years, as you may know from his "Autobiography" [in *The Philosophy of Karl Popper*, ed. Schilpp, pp. 3-1811, on Kant. And Kant felt that the German school of idealists had betrayed him. He specifically repudiated Fichte, and I am sure he would have done the same with Hegel—which doesn't mean that Hegel owed nothing to Kant, but that Hegel had, in a way, betrayed the main thrust of Kant's philosophy by presenting a kind ,of "gnostic" philosophy, an idea of knowledge which Kant always rejected. So I think that is one of the main points—apart from the point that anybody who reads German and is condemned to reading Hegel will soon find that this is no pleasure.

PL: But Kant is no pleasure either, from what I understand!

EHG: Kant is no pleasure; but Kant, one finds, struggles with his formulation. One sometimes feels if he had allowed himself to write in Latin it would have been easier than German, which was at that time a rather unformed language for metaphysical formulations. Hegel used this kind of language often—I think one can't deny it—to impress rather than to enlighten.

PL: But doesn't Popper himself occasionally indulge in *ad hominem* criticism of Hegel in *The Open Society and Its Enemies*?

EHG: Yes, I agree with you. He was a pompous fellow, Hegel, and he invites this kind of ridicule. But this is no argument, I quite agree: he might have been a pompous fellow and still be a good philosopher—and that is undeniable. Popper himself, I think, writes somewhere that he meant his criticism of Hegel as a kind of "scherzo" in between the criticism of the two more serious thinkers. He didn't take Hegel seriously.

PL: So Hegel was sort of the "decoration" in the Open Society?

EHG: Well, yes—it was a kind of more light-hearted attack, because he thought that Plato and Marx were the more worthy opponents.

PL: And yet as an art historian, you described yourself towards the end of *The Sense of Order* [Ithaca, N.Y.: Cornell University Press, 1979, p. 2151 as saying that when it comes to issues of overwhelming style, or even the spirit of an age, you're a "sceptic with an uneasy conscience." So even as someone who is against Hegel, you recognize that there are certain styles in art and in society, for example the Impressionism at the end of the nineteenth century.

EHG: Well, nobody can overlook this—it would be difficult, wouldn't it?

PL: How would your view, then, differ from Hegel's on those dominant styles and themes that you do find in history?

EHG: Well, Hegel thought the whole history of all these branches of human culture can be logically deduced from the exact place from which they start at any point; that every age has an essence which expresses itself in these various fields—of law, of religion, of art, of society, of ethics—and that in a way if you dig deep enough in art you will find the same spirit expressed as you would find in law or in religion. This is a sort of unitary idea of the age—"unitary" is perhaps a little too weak, one almost might use the term "totalitarian"—a total view of every age, in which everything hangs together logically, because it is the unfolding of the Spirit. It's a logical process in Hegel—it's what's known as the dialectic, as you know.

But I don't believe that. I am an individualist. I believe that no doubt people are influenced by each other, and there are such things as movements, and there are such things as the logic of the situation, of inventions, of group formation, which accounts for similarities of what various people do. But I wouldn't say that there is ever a logical necessity of one thing deriving from another in the way in which Hegel tried to demonstrate.

PL: Yes, I remember there was a place in *Objective Knowledge* [London: Oxford University Press, 1972, pp. 125-126] where Popper says that he insists on the fact that the individual really always is free to assert him or herself against what any sort of societal trend might be.

EHG: Yes, within limits of course. I mean it would be very hard to imagine that an Egyptian—an ancient Egyptian—listening to our conversation could have joined in, because he wouldn't know what

we are talking about. So there are limits through preparation, through language, through all these matters. But this is common sense, isn't it; one doesn't have to state this specifically.

But I do agree, and I hold with Popper, that the freedom of the individual either to join or stay outside must always be asserted in history.

PL: Yes, and in a way, revolutions in art and in fashion and so on might even be traced to individuals asserting themselves against the standard forms.

EHG: Well, of course; and revolutions in art, as you call them, are very often, in a way, self-appointed, and self-styled—that is to say, we say that we know what the present trend in art is, but there are thousands of painters working at present who are working in very different styles. Perhaps the critics think they are not characteristic of our age or whatever, but that is in a way done by fiat. It may be that in fifty years' time, when critics look back at our own age, these people who are not now in the Museum of Modern Art will be considered the pioneers of 1979. This is always possible.

PL: Yes, with the wisdom of hindsight. Those things very often do happen.

EHG: Yes, very often. I once wrote that a critic who had tried to describe the art of his time in around 1890 or so would certainly not have known of Van Gogh, he would hardly have known of Cezanne, of Gauguin. How could he? Cezanne was working away somewhere in the south of France; he was a shy man; he didn't want to exhibit much; and one wouldn't know of him.

PL: I agree with you there completely. In the area of music, in our own day, it has happened so many times. The Beatles, for example, were rejected by about twenty-five or twenty-six record companies, who thought they were totally out of sync.

EHG: Were they?—yes—such things are so often told, and they are often true. But it's then a matter of luck, isn't it? Luck plays a tremendous part in cultural history. I mean, whatever rises to the top for a time, you can't foretell. I am interested in this respect in a metaphorical comparison—I don't know if you are interested in such things—we use the metaphor of "currents" in history very much.

PL: Yes.

EHG: Both currents and waves can be predicted up to a point—but when it comes to what is known as "turbulence," that is to say, when the pressure becomes too great, then it is mathematically and theoretically impossible to predict where a particular molecule of water is or will be. And we are such molecules. There's always turbulence in our society.

PL: Yes, I think that's very significant. And one of the reasons why Popper, I think, has been misunderstood in the United States is for that very point. People get frustrated with the fact that

Popper doesn't provide a clear way of predicting things, and they therefore assume that he is anti-

scientific and antirational, when, quite to the contrary,

EHG: No, no—far from it!—it is rational to say that there are certain things which can't be predicted,

and I think again it is fairly well known in many fields that there are limits to prediction. Sometimes

they are simply the limits of our knowledge; but sometimes, as in the case of turbulence, they go a

little deeper than that.

PL: Well, could we distinguish between limits to prediction and limits to knowledge? In other words,

knowledge itself perhaps could grow endlessly, but yet we'd still lack the ability to perfectly predict an

inevitable future.

EHG: Well, I certainly agree with you. I mean, that is the famous Laplace Demon, isn't it?

PL: Yes.

EHG: And Popper has written a certain amount about Laplace's Demon. There is no such thing and

couldn't be. It couldn't be done. He has actually, you may know this, written a rather theoretical paper

about the predictors ["Indeterminism in Quantum Physics and in Classical Physics," British Journal for

the Philosophy of Science (1950-1951): 117-133, 173-195]. There is, for instance, in any apparatus,

random movement of the molecules.

There is random movement, and you can't do much about that. It is something similar to turbulence,

and you can't predict its outcome. There's always noise in

PL: in a system

EHG: in a system and in our system certainly there is noise.

PL: That's a good point, because even when you try to introduce something to reduce the noise, this

of course has a noise component of its own.

EHG: I am sure it has.

PL: So noise can never be eliminated totally. But let's get back for a moment to Kant, because I don't

want to miss that. You mentioned Popper's

EHG: interest in Kant

PL: interest in Kant as opposed to Hegel, and this introduces the whole question of Popper's

"evolutionary epistemology"—I think Donald Campbell coined that term [in his essay "Evolutionary

Epistemology," in The Philosophy of Karl Popper, ed. Schilpp, pp. 413-463].

EHG: Yes.

PL: And I find that approach very, very fascinating.

Art in a Darwinian Context

EHG: So do I! Popper developed it more, perhaps more thoroughly, in his later years. And in some respects, of course, Popper differs here from Kant. Kant's view of reason and all that is a purely anthropological one. Kant never, I think, asked himself how a squirrel can jump from branch to branch, whether the squirrel also has an a priori form of space. But obviously it

PL: It must have.

EHG: Yes, quite. And that is something which is entirely outside of Kant's interests.

PL: How do your own views on art follow from this evolutionary epistemology? I'm thinking specifically, again, of *The Sense of Order*, in which you talk about the biological basis of some of our perceptions.

EHG: Well, I don't think the bridge is all that immediate, but I do think you could develop a theory of art according to which art is a method of creating responses. Popper once said or wrote that language enabled us to tell ourselves a story—you know, to console oneself by telling oneself a story. You also can whistle in the dark. In other words, there are all sorts of things by which the individual finds a kind of shelter and consolation in his own creation. I think that this is a very important part of art: that it creates, call it a "third world," one which is of our own making, and which creates a kind of home fondle mind.

This is not an expressionist theory—as you see, it is a theory, again, of trialand-error. I think that the development of Western music, for instance, shows that somehow, gradually and step-by-step, a system has been developed which is appealing to a very, very large number of people and minds—and not only culture-bound, because Japan, for example, has taken to Western music like anything. There's something objective in the *effects* of great music, and not only *great* music.

I think Plato was right, in other words. You know, in the old Platonic theory of art what is stressed are the effects, rather than anything else. Plato had a magical/medical theory of art, that certain keys have certain effects on the mind, like a drug or spell, and that therefore certain things should be avoided, and certain things should be encouraged.

PL: Yes.

EHG: I do believe that there are such effects. But I do believe that Plato probably underrated the plasticity of the human mind. Just as in foods there is such a thing as an "acquired taste," so there is an acquired taste in art. There is also "brainwashing' in art—the feeling that everybody likes it, I must try it myself, and maybe I can make myself like it. All this plays a part. So I wouldn't say that everybody starts from scratch in art, by any means.

But you could say—without overstressing it, just for the purpose of our conversation—that the tea we

are now having came to us from China, and obviously people noticed a response, that this rather elaborate affair in which you pluck leaves from a tree and brew them, or pour hot water on them, has a pleasant effect of the kind that goes much beyond individuals

PL: or cultures

EHG: having come to us via Russia, and still is known by the Chinese name of "ch'a." Something similar applies to coffee. The way these things migrated and were accepted is quite a good analogy to certain discoveries in the arts, possibly by trial-and-error.

PL: Well, let's get on to that trial-and-error issue. What that seems to suggest both on the individual level and on the societal level is that you have people creating lots of things, but most of them do not survive—they are falsified.

EHG: Yes.

PL: And those things that do survive are the ones that are accepted, or the ones that become the dominant art forms.

EHG: Entirely. You were mentioning the Beatles: there must have been any number of pop groups at that time who tried to be original and this and that, and they are forgotten; but the Beatles, perhaps because they had a very good manager, perhaps because they struck a chord, hit it off. That is a kind of Darwinian survival affair.

PL: Yes, they were the most musically "fit." But now, you see, that type of statement disturbs some people in art, because they would say that whereas in science there is a need and benefit in eliminating incorrect ideas, isn't this a bit of a cold way to look at art—to say that certain things are eliminated or falsified?

EHG: It may be a little cold, but if it is true, what can we do about it? In other words, I do think that there are many variants. I wouldn't say that some of the variants which fall by the wayside are not worthy—they just may never have been given a chance. Even within the work of an individual, you know, there may have been starts which *he* might have developed. I remember listening to some early Mozart quartets where there are things which he never went on with—he followed another line—but he might have been able to do it. That's a different matter.

PL: Yes, that whole question of starting and stopping and then starting something else again—the Darwinian as opposed to the Lamarckiansometimes seems hard to reconcile with the idea of a cumulative progress. Because it almost implies that each artist starts all over again and has to have his or her ideas put through the trial-and-error process.

EHG: No, I don't think it would require that. Because all artists, after all, learn and study the art of their

predecessors, and therefore each artist starts from a baseline. Of course, some never get beyond the

baseline, and only do the well-tried thing; and others, for some reason or other, which may be

external pressures, introduce variations or mutations, if you like, which work.

I think it is possible to build up such a theory—it would be a little arid and a little one-sided—but it is

possible to build up a theory by which one could speak of a kind of "unintentional" creation of art. Yes,

it would be a little bit exaggerated, but after all there are many art styles—ancient Egypt, or

Byzantium—in which, as everybody says, the artists were craftsmen and the tradition was very

strong, but there is still a drift in a particular direction.

PL: Yes, I think that makes a certain amount of sense. In my own studies on the evolution of

communications technologies,

EHG: Yes?

PL: I have found such a process at work time and time again: Thomas Edison, for example, invented

the motion picture process, thinking that it was going to be just an adjunct of the phonograph.

EHG: Did he!

PL: Yes, and the phonograph itself was originally invented to be an adjunct of the telephone.

EHG: And it emancipated itself; it went its own way?

PL: Yes, it was "chosen" or "selected" because it could perform a different task. And this has

happened in many other cases.

EHG: Yes, yes—intention isn't everything, is it? I mean, Edgar Allan Poe invented the whodunit, the

detective story. I don't think he dreamt of the incredible snowballing of one little story. He couldn't

have.

PL: No. So these people—and their unintentional creations—are almost the genes, or the source of

mutations, if you want to stretch the analogy.

EHG: Almost, yes. I agree.

Representation, Reality, and Relativism

PL: The issue of falsification and how it relates to your view of art and decoration I also find very

interesting. Am I wrong in making this equation: that you look at representation, pictorial

representation, as a sort of corroboration or an attempt to corroborate our innate sense of order,

whereas decoration is a sort of jolt or a sort of falsification of

EHG: No, I think that is not, I am afraid, quite how I see it. I think there is a problem in representing something. The starting point is what is known as a conceptual image—you know, the round circle with the two dots and the nose and the mouth. And if I want to make a portrait, I have to go beyond this pretty much. Here we have one particular problem of creating a correct or acceptable image of a bowl with fruit [gestures to still life painting on wall], or a square in a city, or whatever else we may see. And in this respect, you can arrive at a state where you say this is the correct representation of what is seen from a particular point.

Now there are two issues, I think, to be mentioned here, which are sometimes confused. The first is that, in my view, there is no problem in three-dimensional representation. I mean, from an *artistic* point of view, there are lots of problems; but you can make a facsimile of a three-dimensional object. You see plenty of them in the Natural History Museum or anywhere else which are simply like

PL: life

EHG: like life, or like—well, you can also make a facsimile of this cup [gestures to teacup on table].

PL: OK, like reality, then?

EHG: Well, I mean the two are nearly or fully indistinguishable. Unless you apply certain tests, they are indistinguishable. So I don't think this is a very great problem. There are artificial flowers, artificial teeth, artificial eyes, or take what you like.

But then there is the much greater problem of two-dimensional representation of a three-dimensional reality. Now this you can say is always a bit of a problem because by and large we don't keep our eyes still. Our reality is always in motion because we are in motion. And the question of what is actually involved is even a little more complex, because we look with two eyes. However, from a certain distance there is no such problem because we don't see 3-D in things that are far away. And the photograph has shown that, well, you can record very faithfully what is seen from a particular point of view. That is to say, what is occluded and what is seen when I stand ten yards from the window and look out into Central Park—this, tree is in front of this place, and so on and so forth. You must keep your eyes still, and you must measure, and you must do all these tricks which are taught, in order to achieve this likeness of a particular view. I mean, this engraving on the wall [gestures to engraving that depicts a courtyard or a square with people in foreground, surrounded by three sides of enclosure or building] is not exactly what a person would see from a particular point, because it brings in things like the slanting walls which are different, you see. However, this is representation. The problem is interesting, but I don't think immensely complex.

I think it is more interesting to ask why in the history of art this kind of solution, of an accurate mapping of what is seen from a particular point of view, has only been achieved once or perhaps twice—once in ancient Greece perhaps, or closely to that, and once after the Renaissance. The answer is, I think, because we don't relate to the world in this way. As I said, we move through the world—I see the teacup, as J. J. Gibson would say, as a thing in the round, which I can grasp. And not only because I have tactile memories—all these are "false starts"—but because this is how our

sensory system works. I really see the world in three dimensions. And the reduction of this experience to two dimensions is a tremendous achievement. But many civilizations didn't aim at this achievement

and didn't get it.

PL: Now that's an interesting point, because in Art and Illusion [Princeton, N.J.: Princeton University

Press, 1960] you take great pains to say that the conventional view that the Egyptians were merely

inept, and that's why they had their flat representations, is incorrect—you disagreed with that.

EHG: Yes indeed.

PL: Well then, what were the Egyptians and other societies that did not try for accurate representation

aiming for?

EHG: Well, if you want a very brief catchword, it's a kind of pictographic art. They wanted to say, here

is a man, and here is a boat, and it worked.

PL: But from the point of view of evolutionary epistemology, and the idea that art serves some sort of

useful purpose, it seems to me clear—it doesn't really need much more explanation—that a realistic

portrayal of the world would serve the biological purpose of capturing reality for whatever need:

reference, memory,

EHG: Not necessarily—a map also captures reality.

PL: Yes, but then what would be the purpose, the advantage, of distortion? EHG: Well, a diagram captures some sort of reality, and the purpose of Egyptian art—and I actually discussed a little hypothesis about it in Art and Illusion—the purpose of Egyptian art was certainly a very static preservation of the world in which a man had lived in his lifetime: the important things there. So there is no contradiction there in my schematic view. It was the narrative purpose of Greek art, the dramatic

evocation of a particular event, which led to the other approach.

PL: So in other words, the Egyptians were, in a sense, attending to a different aspect of reality?

EHG: Absolutely, yes. And while I do believe that the Greeks had a cumulative process by which they corrected the schema and came closer and closer to, let us say, the rendering of the human body, I think that Egyptian art was marvelously adapted to the purpose of art in that society. But I think this was more in the way of drift than in the way of conscious search. And I think that is a rule, I would

say, that art becomes adapted to the needs of the society.

PL: So we again get back to this view

EHG: Darwinian view

PL: Yes, unintentional creation and then selection

EHG: and the ecological niche of the image, you see. That's what we do.

PL: And you would draw an equation between the ecological niche of the image and the needs of the society that the image is created in.

EHG: Yes, absolutely, absolutely. Of course, usually it isn't just one need, there are many needs; but there may be, as I have tried to say, a dominant need. For instance, in the Middle Ages, it's surely religious art that is the dominant need; and in our society it is "Art" with a capital "A," isn't it? To create something which has prestige value and expression value and so on, something entirely different.

PL: But underlying these views you would still agree with Popper that there is an absolute, objective reality out there—a reality which people perhaps see differently—but you would not at all be a subjectivist or a relativist.

EHG: No, I am not a subjectivist or a relativist. I do think that there are very clear standards of accuracy, only you have to state them at first—for example, by what standard is this an accurate map? If you have a map of New York, you don't terribly worry about the curvature of the earth; but if you have a map of the United States, it becomes a bit of a problem.

PL: Yes. But it tends to be a tiny bit confusing—these different standards for 'accuracy—because if you say that, in the case of Egyptian art, they were attending to a different aspect of reality,

EHG: Yes.

PL: and I remember the cartoon that you have on the front page of Art and Illusion [p. 2: drawing by Alain, c. 1955, The New Yorker, of art class in ancient Egypt, with woman model deliberately posing in ancient Egyptian "flat perspective" posture of head-to-the-side, arms raised, etc.],

EHG: Yes, The New Yorker cartoon.

PL: that's very close to saying, well, for the Egyptians, the world was simply different than it is for us.

EHG: No, I think the image was different, not the world.

PL: But doesn't The New Yorker cartoon suggest that Egyptian artists merely painted what they saw—that the flat perspective of Egyptian art is a realistic image of the object or human pose that the artists saw?

EHG: Well, they used images for an entirely different purpose, you see. Just as in advertising, posters can stress very different things from pretty girls to the produce which you sell, or anything else: map-like, or diagrammatic, or grotesque, or any other way.

I have sometimes stressed the *really* Darwinian point of view as far as realism is concerned—the antirelativistic point of view—by pointing out that there are these astonishing things in nature, like moths
which look like leaves, and so on—organisms using mimicry, protective coloring, and the like. And I'm
quite sure if you have ever seen these astonishing phenomena—this moth which has all the
characteristics of the leaf—you would agree, as I always say, that it looks like a leaf, obviously, also to
the birds. Otherwise it wouldn't have developed. And it certainly must have looked like a leaf to an
ancient Egyptian and to Picasso. One cannot deny this. And, as I have said only recently, nature has
various styles. If you want to be Darwinian, there are these "eyes" which develop on moths and
caterpillars which have a frightening characteristic, and they are expressionist "eyes," because they
are exaggerated "eyes." But they do the trick of deterring, warding off the predator, because they look
like eyes. And obviously various predators have an inbred reaction—they are frightened by the
exaggerated, warning "eyes" of the caterpillar. And the organism, this caterpillar, develops and
exploits the frightened reaction of its predators.

PL: Well, you make the point, and I agree with you on this completely, that very often nature comes up with, or has come up with, solutions to problems which technology and artifice can only begin to address.

EHG: Exactly. And I do think that, from this point of view, it comes back to the problem of response: if you look at the matter of likeness, not as, "is a like b?" but, "do a and b elicit a similar response?"

PL: a functional likeness

EHG: It's a functional likeness. You can say that the bait which the angler puts on his hook obviously creates a response in the fish to snap. And whether it is for us like a fly, well, sometimes it is, sometimes it isn't. But the likeness is in the response. That, it seems to me, is the key problem here.

PL: Yes, I see what you are saying: in a sense, it doesn't really matter what they "actually" look like. But this again gets into the question, does it even make sense at all to ever talk about what things "actually" look like? Or

EHG: Yes!

PL: Or is the only meaningful discussion one of what response they get from us?

EHG: Well, I mean, "actually look like"—if you see them in infra-red light, or under an electro-scanning microscope, they might look very different.

PL: Yes.

EHG: So from that point of view you can always quibble. But the response is the same. And the information value is always the same. If they send photographs from Mars or from Saturn nobody quibbles with the telescopes.

PL: That's true. But you know that you came up with the example of snowflakes in *The Sense of Order*.

EHG: Yes.

PL: and it really interests me that when you look at snowflakes with the naked eye, they are nothing, just dabs of white.

EHG: Yes, quite.

PL: And yet when you examine them under magnification, of course, they are quite beautiful.

EHG: Yes, and the magnification needn't even be

PL: too strong, that's right. So what then is the "reality" of the snowflake?

EHG: Well, you can say that if you examine human skin under a microscope, or even under weak magnification, it doesn't look very nice.

PL: No, it doesn't.

EHG: So this is, again, our response. We are keyed to a certain scale, aren't we? And we are programmed to perceive a certain scale in a certain way. I think Swift knew that. Certainly, you know, in *Gulliver's Travels*,

PL: Yes, the Lilliputians.

EHG: he had such a dreadful time with them, and also with the Brobdingnags.

PL: The giants, yes. Actually, there are some people who go so far as to say that when certain environments are completely different from us in scale—cosmic states on the one hand, or quantum states on the other—we may not even have the ability to comprehend them, which is why they give us so much trouble.

EHG: Of course it all depends on what we mean by "comprehending." But certainly there are borderline cases, like what is going on in a black hole, where we are very doubtful.

PL: But our technologies, on the other hand, can bring them back into scale—that's one of the uses of our technologies.

EHG: Well, you see, it is in a certain sense very interesting that with all these aids, like the electroscanning microscope, but even an ordinary optical microscope, we say that we "see" these things, or what they "look" like. But they don't look like that. We *make* them visible.

PL: Yes, that may be the crux of this whole problem—this notion of making reality. But let me question this issue of reality and response from just one other perspective, before we move on to something else. You talk in *The Sense of Order* about the circles of mushrooms that we see in forests.

EHG: Yes.

PL: What would your reaction be if someone were to say to you that it's meaningless to talk about the circle of mushrooms as an objective state? That although the mushrooms themselves exist objectively, they look like they are in a circle only in the ordering of our minds, when we perceive it. So it really is the human sense of order, not "natural" order, that gives us this pleasing effect.

EHG: Well, the *pleasing* is in the human mind. But the geometry of the arrangement is surely an objective fact. You could say that if you measure the circumference in relation to the diameter of the circle, you get the figure "pi," or whatever else. That is, after all, not something subjective.

PL: And yet there always seems to be a slight problem with Kant, and even to a certain extent with Popper here—a tiny bit of a contradiction: if you think that there are innate aspects of the human mind which order our senses.

EHG: Yes?

PL: then you can get into difficulty with an objective theory of aesthetics as to where the reality of the circle lies. Is it out there, or is it inside?

EHG: I don't see it that way. We all know that green is a certain wavelength, and that our eyes are so constructed that we only respond, our retina does, to a very limited range of wavelengths. And so whether it makes sense to say that what is "really" there are waves or light quanta, well, from the one point of view, this is what they "really" are. As you may know, Goethe, for instance, was furious with

PL: with Newton, and his mechanistic theory of color.

EHG: Yes. But I don't terribly worry, because I do see ourselves as evolving organisms—our eyes as instruments to catch certain waves.

PL: John Watkins makes the interesting point [in his essay "The Unity of Popper's Thought," in *The Philosophy of Karl Popper*, ed. Schilpp, pp. 371-412] that, for example, if the dog could not smell whether meat was good or rotten in the rather coarse way that it does—in other words, if the dog had some sort of artificial nose which picked up the vibrations of smell in a much more subtle,

sophisticated way—the dog probably wouldn't last too long. So, in a way, we get back to a Darwinian sort of theory here.

EHG: There are no "vibrations" in smell, if I may say so: it is particles.

PL: I'm probably misquoting Watkins. [I am: Watkins, on pp. 403-404, talks metaphorically about meat emitting certain types of "signals."]

EHG: However, about the dog's nose—yes, maybe that is so—it must have a very quick trigger reaction, and that is certainly true.

The Origins of Art

PL: All right, just shifting the discussion a little bit, I wonder if we could get back for a moment to Popper's role as a philosopher of science, and something you said earlier about having something in common with Popper—that you are both historians. Now many people have commented upon the likelihood that art may really be more primary, historically, than science. And yet so much attention recently has been paid to the philosophy of science, and not that much to the philosophy of art—even though the cave paintings in Lascaux may really be the oldest form of human expression, certainly predating any known science or any

EHG: Most certainly.

PL: So would it be exaggerating things too much to say that in a sense what you're doing by applying Popper—applying some of what Popper has worked out in the philosophy of science to the philosophy of art—is really raising the correct primacy of art as opposed to science?

EHG: I wouldn't see it that way. You see, I have always resisted the category of "Art" with a capital "A." As you may know, what people call art in various civilizations differs enormously. In fact, our notion of art is an eighteenth-century notion—"fine arts," you know. After all, even earlier and even later were the "art" of healing, and the "art" of love, and the "art" of war, and the "art" of who knows what. It really is a term for skill, isn't it?

Now, like Popper, I don't think one should waste a lot of time on definitions; but one must be aware that our grouping of, let us say, Lascaux under "art," and the arrowheads which may be found there not under "art," is our point of view, our categorizing.

About Lascaux, though I have been lucky enough to have seen it, I am very much aware of the depths of our ignorance about these cave paintings. People always enthuse how marvelously naturalistic they are—I have never encountered a bison in my life, and I don't know what they looked like.

PL: Well, there are lots of them in American cowboy-and-Indian movies.

EHG: Ah, yes.

PL: But certainly no bison with four heads superimposed one upon another!

EHG: I don't know. I mean, I think there is a certain amount of wishful thinking in these discussions. Also, I mean, the work is a marvel, what we see in these caves, but we have so little idea of how they were seen to begin with—it was dark, probably, in those caves.

PL: Yes, that's a serious, intriguing problem.

EHG: I just don't know what to say about it.

PL: Are you familiar with the work of Alexander Marshack, who has written a book called *The Roots of Civilization* [New York: McGraw-Hill, 1972]?

EHG: No, I don't know it.

PL: He places tremendous emphasis on what must have been needed to be able to paint those types of paintings, and he has deduced from this that there must have been a fairly complex language system, perhaps even a rudimentary system of science of some sort to mix the pigments.

EHG: I would agree that this is likely. I would also think it likely that these people—these medicine men, or whatever they were, what can we know—may have had something like pattern books. They may have walked around with skins on which there were models of this kind—what do we know? We can't know everything.

PL: Yes. But they are fascinating, because they are, I guess, the earliest expressions of World 3, or the earliest objects of World 3 that have come down to us,

EHG: which have survived, yes, yes. But of course the separation there between human and subhuman is not so clear, particularly now after these works on primates, you know.

PL: Well, I am fairly ignorant in these fields, but I must say that I've never been particularly impressed with those primate examples of "art," or whatever you might call them.

EHG: No, "art?" "Art?" Absolutely not. But technology!

PL: Yes.

EHG: You know, Jane Goodall's chimps who used to fish for termites with blades of grass.

PL: Yes, I would agree with you. But I think you have to differentiate between a primate that gets these skills spontaneously, or out of its own gene pool, and one that's taught the skills through great

rigor by human beings. Although tool behavior may occur spontaneously in the wild, the "art" that apes produce always seems to take place under human supervision.

EHG: Oh yes, I quite agree with you—it's an entirely different thing. But we do know that there are astounding abilities of chimps. The most astounding I know is the primate who looks into a mirror, and has a spot on his forehead, and can go on and remove it himself.

PL: Yes, that seems to suggest a sort of awareness of self, a self-image, and that's significant.

EHG: Yes, that goes pretty far.

A Note on Popper's Acceptance of Criticism

PL: OK, one last question, then, for this interview. We were talking about falsification, and, of course, Popper's critical method. Many people think that the method of falsification and criticism is useful when it is applied to other people. But of course no one likes to be falsified—people dislike being falsified themselves.

EHG: Absolutely true, yes.

PL: Well then, as someone who has been a longtime personal friend of Popper,

EHG: Yes.

PL: how do you think Popper accepts falsification of his own ideas? Does he accept criticism of his own work easily? Some people say that Popper, who so strongly champions criticism as a method, vehemently dislikes criticism directed against his own work.

EHG: No, that would be entirely untrue, that he dislikes criticism. He dislikes frivolous criticism. His standards of what he demands of a knowledge of his own work, before he is criticized, are perhaps very exacting. This is understandable—I share this view, that it is irksome and irritating to be told at great length what you got wrong, when you actually said that this is not so. And since most people don't like to read, and prefer to criticize without careful reading, it is quite true that most people act, as you know, on rumors. All they know, let us say, of Popper's work is falsification and such things. And all the qualifications and discussions and examples he used are missed—you have to read him. And this takes time. And therefore they prefer to rush in without having done it—this happens to me, and it happens to everyone, I daresay. People nowadays are not very patient readers. And they think that if they ask "where does he stand?"—you know, that's a famous way of looking at it—they have a kind of cognitive map, and they think "ah, he's that fellow who is for this and against that," and then they think they can build up the whole thing themselves. But they can't. So what Popper wants is to be read carefully. Then he's very interested in criticism. But it's true that this is asking a lot, for Popper might say, well, you don't know that in the footnote to this and that I have discussed this very question.

PL: Sometimes Popper's most interesting points are made in his footnotes.

EHG: That's right. I can tell you a Popper anecdote which I like. It's a true one. At the LSE—in London, the School of Economics—they wanted to introduce one of those rapid-reading courses. You know them, the "quick-reading?"

PL: Yes, "speed-reading."

EHG: Yes. And Popper really did go to the director and ask him whether he could introduce a slow-reading course.