



THE UNWITTING RIVAL:

By C. P. SNOW

IN SEPTEMBER 1934 I published *The Search*. It had a good reception. Publishers were bidding for me: One was trying to bring off an arrangement with an American firm by which they jointly guaranteed me an income for three years, so as to extricate me from Cambridge and send me off to write by the Mediterranean. In those days, for some esoteric reason, it was considered almost impossible to write except on the shores of the Mediterranean. All this was, of course, gratifying. Later that autumn a letter arrived on my breakfast table in college, addressed in an unknown handwriting, small and elegant.

It was signed H. G. Wells. He had read my book with the liveliest interest and sympathy, he said. Would I come up to London for lunch?

He was living at that time in a flat in Chiltern Court, next door to Baker Street Station. It was the same block of flats in which Arnold Bennett had died, four years before. With my usual obsessive punctuality, I arrived on time. I was shown into a small sitting room and told that Mr. Wells would join me. The minutes passed. I spent some of them staring down from the window into Baker Street. It was a horrible dark November day—clouds hanging over the roof tops—a Holmes-and-Watson day—pouring with rain.

I had been asked for 1 p.m., and it was after half-past. I was beginning to wonder what had gone wrong when the door opened. A small rotund form entered. "Ah, it's you," he said in that voice, at the same time hoarse and high-pitched, which no one ever exactly imitated. "They told me you were here."

I thought that was a bit unnecessary. So perhaps did he, for then he apologized for being late. As he did so, I could not help but realize that there was something on his mind. In his turn he walked over to the window, and stood with his back to me, looking at the rain.

"You're married, aren't you, Snow?" he said without turning round.

I replied that I was not.

"Anyway," he addressed the dismal street, "I could see from your book that you knew some things."

He was extremely glum. Why had he not a wife to look after him? Why had neither of us wives to look after us? Why, in particular, would someone called Moura not marry him?

This I found a very difficult question, since I had met him only for ten minutes and had never heard of Moura. I tried to cheer him up, though for me the conversation was scraping uncomfortably near the bone: I had recently lost someone whom I had much wanted to marry.

Why were we unluckier than other men, Wells demanded. It was impossible to understand Moura. She was willing and happy to live with him, but not to marry him. She was always short of money. If she married him, she would be secure for the rest of her life. What reasons could I suggest for her behavior? It was a good deal later before we sat down at last to lunch.

Lunch did not relieve the gloom. Wells was having a special diet and ate very little; I had a small lamb chop and some mashed potatoes. We had a bottle of wine, but Wells, who never drank much, took only half a glass. Occasionally he got off the subject of marriage. He was taking my novel as though it were straight, factual, autobiography: Nothing teaches writers, not even their own books. He assumed that I had had a disappointment in research, and so wanted to give it up. He didn't want me to. He had always wished that he had stayed a scientist. No doubt the scientific life had its dangers and its setbacks. No doubt it bruised one's ego as a literary life did. But it must be much more satisfying. And when one's work was done, what human honor could compare with the plain Mr. F.R.S.?

I remembered he had said something like that in one of his early books. Was it *The Food of the Gods*? No, he didn't want to talk about his books; he wasn't interested in them. He wanted to talk about marriage, Moura, and the scientific life.

Then Moura herself entered. She had forgotten her latchkey, she said. She was a woman in early middle age, handsome, dashing, strong as Mother Russia. I didn't know anything of her heritage or history, I didn't even know her surname, but I gathered that she was Rus-

sian, probably an aristocrat, but on close terms with post-revolutionary writers.

She sat down at the table and with gusto helped me finish the bottle of wine. She gave out well-being, she was cheerful. The temperature of the party began to rise. Wells was looking at her with love and irritation. She talked to him with down-to-earth affection. But Wells's irritation grew when she also talked to me. I have her permission to make this comment: We have been friends for many years, in fact since that first meeting. She liked the company of men. She had always had an interest in intelligent young men, especially if they had literary inclinations. She was interested in me, and showed it. Wells disapproved. It was getting on for 4:00, and he made it clear that it was time I went. Come back and see us soon, said Moura. But I was not invited to Chiltern Court again, though I met him a good many times away from home.

I became very fond of him, though I doubt whether I picked up very much that I could not have divined from his books. He was marvelously inventive, but that anyone can read for himself. In the scientific romances, such as *The First Men in the Moon* and *The War of the Worlds*, he invented more literary devices than most people do in their whole career. He was just as inventive when he applied his mind to games for children—or to war. Between 1900 and 1914 he made a whole set of practical prophecies, including the concepts of the tank and the military aircraft.

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IT was a great gift. It gained him instant recognition. As soon as *The Time Machine* and *The War of the Worlds* were published, he was known as a writer; he became comfortably off. His health improved. In 1900, when he was thirty-four, he was already started on his second public career, the one he thought more urgent than a novelist's, as the great educator of his time. The great educator of unlikely people, incidentally. *He is a seer*, wrote Winston Churchill when Wells was a very old man.

It is no use regretting this. Wells could no more avoid teaching than Tolstoy could. It was part of him. If it hadn't been part of him, his best straight novels—*Tono-Bungay*, *Kipps*, *The History of Mr. Polly*—would have been different

The text on this and the following page is a preview of C. P. [Lord] Snow's newest book, *Variety of Men*, which Charles Scribner's Sons will publish on April 24. The text is copyright ©1966 by C. P. Snow.

Or, How Not to Advise the Lovelorn



books. But this didactic fiber—which, by the by, a number of the greatest artists have possessed—was, I think, strengthened by the tumults of his sexual life. He wanted, as most of us do, to justify himself. He wanted a society into which his life would fit. And that would take a pretty major transformation of society, for his life was a very odd one.

LIKE Dickens, whom he resembled in more ways than one, he was a man of strong sexuality. Like Dickens, in his early manhood he was a bad picker. He fell passionately in love with his cousin, who seems to have been a nice simple girl. He married her, defying illness and penury—and then found that, though she was fond of him, she couldn't give him any response. As far as he was concerned, she was frigid. After a year or two, Wells ran off with a student of his.

That all sounds in character for an active, impatient man. But there were two singularities. The first was that he stayed in love with his cousin for years, long after they had been divorced and he had married his student. Somehow his cousin had captured his sexual imagination. The second singularity was that his second wife, who was intelligent and charming and who looked after him until he died, also could not give him the kind of love he wanted.

So far the pattern is like Dickens's. For Dickens, after his years of a deadening marriage, broke it all up and went to Ellen Ternan—with whom he had a miserable time. But that happened when Dickens was middle-aged. Wells was still young at the time of his second marriage. He was also, underneath his Little Man comedy, a much more ruthless man than Dickens. Wells knew what he was going to take from life: He would only get it if he took it—he was just not going to be cheated. So his second wife became and remained a loving ally—it was a curious and touching relation—and Wells searched for joy, passion, love affairs, excitement, total love, elsewhere.

He searched, it should be said, with remarkable efficacy. He was nothing much to look at; he was short, and when his health established itself in his mid-thirties, he promptly became tubby. He was always slightly ashamed of his physique and of his squeaky voice. All he had to offer on the surface was a fine forehead, and beautiful, sad, unworldly,

imaginative eyes. But he rapidly discovered that, as he liked to say, love can compel love: Desire can certainly compel desire. He was great fun, a wonderful talker; he wanted women—it did not take long for women to want him.

He chose for his major loves (or they chose him) some of the most remarkable women of his time. One can trace the effect not only of their attractiveness but of their intelligence in semi-autobiographical projections such as *Ann Veronica*, *The New Machiavelli*, and *The World of William Clissold*. It was by any odds an unusual life. It aroused both the envy and the disapproval of his contemporaries; he paid no attention, he was set on wringing out of existence all that in his bitter youth he had dreamed of.

These complications—for, though it was an adventurous life, it was, of course, not an easy one—helped shape his vision of a new society and a new enlightenment. The new society would be founded on science; no one could stop it; poverty, hunger, the material miseries of the poor, were an insult to man's intelligence and would be swept away. And also, out of this scientific revolution would come a new enlightenment in which people would break free from sexual traditions and enjoy themselves far more gloriously.....

Those dots were a trick of his and look odd today. So does a lot of his emancipatory thinking. Yet even though he was rationalizing his own life, some of it has come true in the Western world. And certainly this part of his message, quite as much as the sober scientific foresight, made him an influence on the intelligent young for thirty years. So much an influence, in fact, that most of his preaching will not be read again. It has sunk into the common assumptions. Some books of his, though, are being increasingly reread. By a pleasing irony they are those which sparkle with those native gifts he took so lightly.

PEOPLE have tried to disparage his social thinking by saying that he was optimistic. And since that is the harshest charge which can be brought against any modern writer, they think they need say no more. In fact, in the sense the criticism is intended, it is nonsense. Wells was about as much inclined as St. Augustine to think men were naturally

good, or naturally wise. His temperament forbade it: and if his temperament had not done so, his education would have. For whatever evolutionary theory taught, it was not a belief in the survival value of the sweet and innocent. He *did* believe that in man's crawl out from the caves up to the ramshackle society of 1900, the human species had acquired a bit more control over its own fate and that it was no longer necessary for most of the human race to live hungry and die early. In his impatient fashion, he believed that this revolution could take place more quickly than it has done. If that is blind optimism, give us more of it.



C. P. (LORD) SNOW IS NOTED as a novelist but is probably more famous as author of the essay titled, *The Two Cultures*. His best known accusation against the so-called humanitarian culture, as opposed to the so-called scientific culture, is that humanitarians tend to remain ignorant of the second law of thermodynamics. Anyone subject to love affairs knows this law empirically without necessarily being able to elucidate it as a theoretical statement. Two very funny humanitarians who share Lord Snow's English birthright—Michael Flanders (left, above) and Donald Swann (at the piano)—have fitted the second law of thermodynamics to their own peculiar form of music in a revue called *The Drop of Another Hat*. With unexpectedly accurate popularization of scientific phraseology throughout, they have been enlightening audiences at the Booth Theatre in New York City since last December 27. The lyrics of the Flanders-Swann version of the "second law" are not reproduced here because the printer has no appropriate symbols for the thumps with which the phrasing is punctuated.

—J.L.

By GRANT SWINGER

THE GENESIS and history of the National Animal Speech Agency (NASA) are too well known to require detailed treatment before this audience. But, as one who has been privileged to witness the development and growth of this remarkable organization, I believe it would be useful to set forth a few points that perhaps have been overlooked in the general rush of events.

As will be recalled, NASA's incredible growth had its origins in the President's challenge to the nation "to teach an animal to speak in this decade." It has been contended, of course, that the challenge was simply a device to divert attention from the failure of certain foreign ventures. But a more realistic view, I contend, is that both the presentation and the acceptance of this challenge were inevitable consequences of national dynamics. Clearly, any nation that aspires to greatness cannot assent to a subordinate position in a technology so rich in military, economic, and cultural implications.

Be that as it may, the fact is that the acceptance of the challenge released a stream of energies of unparalleled dimensions in our nation's history. Let us briefly consider just a very few of the multitudinous consequences of that decision. "To teach an animal to speak in this decade" is a goal that can be stated in less than a breathful of words, but, as we are all well aware, it is a goal whose attainment has required a marshaling of effort and excellence that is remaking the nation.

Look back, for example, at the uncertainties that faced those few administrators, scientists, and engineers who courageously developed this proposal. Teach an animal to speak. Yes, but which animal? And what should the animal be taught to say? At the present time, when we estimate that we are two-thirds along the way in this great national under-

taking, such questions seem elementary and remote. But it is necessary to recognize that just a very few years ago these questions symbolized matters of the greatest uncertainty. Fortunately, the nation had the services of several men of great foresight, courage, and experience to lead the way. For, let us not forget those skillful few who, in now happily forgotten days of strife, had pioneered in this great work. To our great gain, in those bygone days they had developed a primitive technology of animal speech. This speech, it must be acknowledged, was of the most scurrilous, vituperative, and vile nature, but it is difficult to argue with the explanation that in those long-ago circumstances the men who taught animals to speak could not be held responsible for what the animals chose to say.

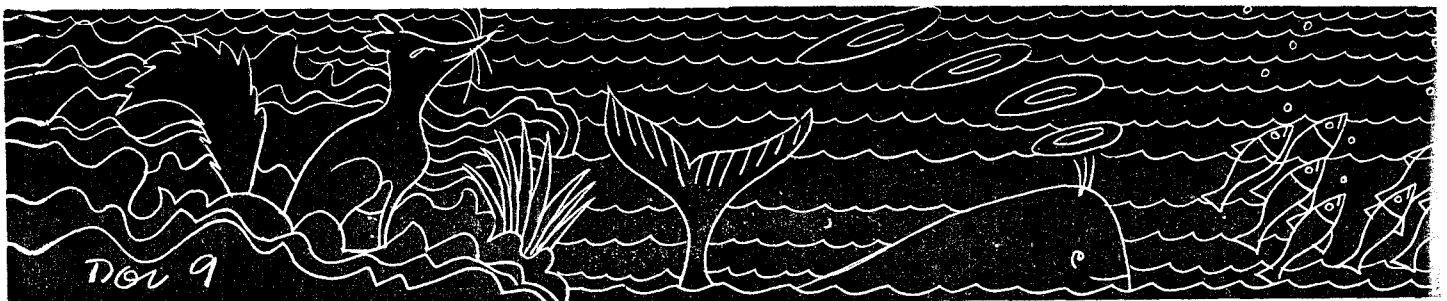
Now, there is no need to dwell on the vast amount of uninformed carping that has been directed at this program. Success, needless to say, speaks for itself, but, if Project Mother Goose had to defend itself, there would of course be no difficulty in justifying the admittedly vast expenditures that it has entailed. In terms of pushing back the frontiers of knowledge, the project has been an unprecedented boon to virtually every scientific discipline. The initial phase, as we all know, required the collaborative efforts of zoologists and geographers to inventory the possible subjects; psychologists, physiologists, and linguists to develop a theory of animal speech; audio-engineers, biologists, and veterinary surgeons to tackle the once seemingly impossible problems of somatic reconstruction necessary for success. Out of these efforts have come many intellectual triumphs, not the least of which is a new scientific discipline, low-temperature linguistics; while the objectives, methods, and purposes of this new field of scientific pioneering are yet to be determined, its work proceeds at a rapid pace, for which we are all grateful.

And let us not forget the great variety of other disciplines that have been drawn into the project: the legal scholars, for example, who, with great foresight, have been wrestling with the problem of the admissibility of animal testimony in legal proceedings. All these efforts, needless to say, have spun off valuable products and techniques of immeasurable worth to the nation's economy. In fact, if the project can claim no more than invention of the re-usable tongue depressor, now in an advanced stage of development, it will have more than paid for itself in social worth.

Under the newly established University Program for the Comprehensive Handling and Utilization of Knowledge, known as Project UPCHUK, we are diligently searching for still other applications of the knowledge that has been specifically developed for Mother Goose.

Furthermore, how can one compute in dollars the value of the scientific stimulation that has resulted from the project? I cannot assign a price tag to this factor, but I think it can be easily argued that we have all benefited from the at times violent debate that has raged over whether the mule is essentially bass or baritone. In these speculative controversies, I believe it is no exaggeration to say, careers have been placed on the line, and we all eagerly await the outcome.

THE first stages of the project were, as we all remember, halting and cautious but, at the same time, immensely encouraging. When Owl-I mounted the podium at the Center and, before the eyes and ears of the world, uttered the first word of "The Star-Spangled Banner," "Oh," there were those who scoffed, those who contended it was not a word, those who, with not a few snickers, pointed out that a Soviet ox had already recited the first four words of the *Internationale*. Well, so it had, but we started late, and we had to pay for our



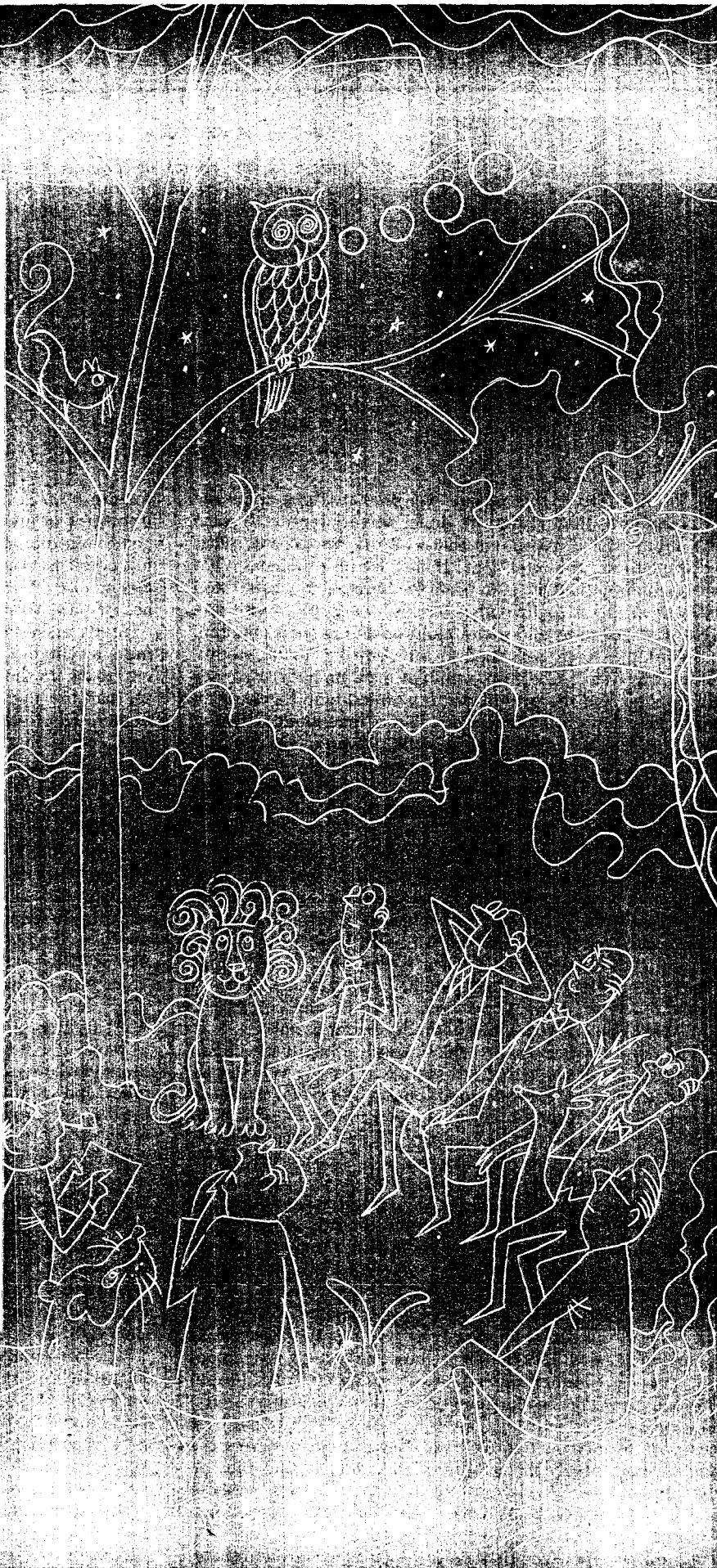
lack of foresight with time—time to develop the capacity to work with heavy animals. But we are making progress.

Now, where do we stand? The answer is that we are advancing across a broad front, with peaceful and military efforts closely coordinated to assure maximum efficiency. The Defense Department, of course, has had great success in its project to develop a reconnaissance squirrel, as well as other projects that I need not go into here. We are on our way.

With the advice and cooperation of some of our leading scientific institutions, which have at last wised up, we can with confidence begin to formulate plans for post-Mother Goose. Should we perhaps strive for a duet of St. Bernards doing "Old Man River"? I don't know. But, needless to say, this proposal is being given serious consideration.

The next step, however, remains to be determined. But what is certain at this point is that we have the momentum, the talent, and the will to succeed. In conclusion, let us recall that it was Benjamin Franklin, or possibly Benjamin Spock, who said, "What good is a baby?" And I believe it was Faraday who, when asked about nuclear fission, said, "Some-day you'll tax it." I think the lessons of history are there for us to read. Let us hope that we can read them clearly. Thank you.

Dr. Grant Swinger is a sometime pseudonym for Daniel S. Greenberg, staff writer for *Science*, journal of the American Association for the Advancement of Science. When in the Swinger mood, Mr. Greenberg describes himself as director of the Breakthrough Institute and chairman of the Board of the Center for the Absorption of Federal Funds. This article was adapted from a Swinger address at the Center for Intellectual Evanescence, where Swinger received the Hunter von Tenure award for his monograph "Overhead and Underhand: The Economics of Academic Research." Reproduction in *SR* is by permission of *Science* and of Mr. Greenberg.



THE RESEARCH FRONTIER



—University of Wisconsin.

WHERE IS SCIENCE TAKING US?

Into a widening dawn of awareness of need to consider man's future on the only planet he has known as a home. Earth's atmosphere has become so polluted that immediate effects on human health are beginning to be observable. The long-range consequences are more subtle; but these, too, are now asserting themselves as changes in the climate.

The March 1967 issue of the "Bulletin of the American Meteorological Society" carries a report written jointly by a meteorologist and an archeologist under the heading: "Possibilities of Major Climatic Modification and their Implications: North-west India, A Case for Study." The meteorologist-author of this paper is Professor Reid A. Bryson, head of the largest meteorology department at any university in America—the University of Wisconsin. The archeologist-author is David A. Buerreis, also of the Wisconsin faculty. Because of the strong technical flavor of their work,

BY REID A. BRYSON
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IT'S NOT TRUE that no one ever does anything about the weather. Many things are done: some intentional, some unintentional. Assuming that as a rule we do only what we want to do, the intentional things are no problem. What we do unintentionally is a problem because we can't stop doing it until we realize what we are doing and appreciate what it means to us and to our children and to their children.

To set the stage, let's look at intentional climatic modification. Ever since the first primitive man threw a skin over his shoulder and discovered that it warmed him, he has been practicing climatic modification. Later, man built a house. This was climatic control on a scale of yards. On the still larger scale of acres, man has also modified the climate by planting trees. The climate under the trees is different from that in the open air. Irrigation changes the climate on a scale of square miles.

In the last few years there has been considerable discussion of the possibility of modifying the climate of even larger areas. You have read in one place or another about the possibility of cloud seeding. Whether or not it is successful is a different question which we won't look at today. It is thought that introduction of silver iodide crystals into every cloud that comes along might, under ideal circumstances, increase the rainfall by 10 per cent under certain conditions. This would be on a scale of hundreds of square miles.

The most obvious way in which man has modified climate unconsciously is through the building of cities. When man builds a city he builds waterproof houses and paves streets so they will be waterproof. He may waterproof as much as 50 to 60 per cent of the area of the city. In this waterproof area, the water runs off rather than soaks in. There are fewer trees in the city and less grass than in the open countryside, so they don't transpire as much water vapor into the air. Consequently, the city is drier, and the surface underfoot is drier than in the open countryside. Any dust that gets on that surface may be stirred up to mix with thousands of tons of smoke per day that is put out by city chimneys.

The combined effect is to change the composition of the air. City air may carry anywhere from ten to 10,000 times as many particles as does the air in the open country. Megalopolis (that great metropolitan area extending from Boston through New York to Washington) is almost continuous city. The air passing over Megalopolis increases its dust load by a factor of twenty on the average. This dust load lowers the amount and affects the quality of the sunlight that falls on the city. An average city gets up to 30 per cent less sunlight and 90 per cent less ultraviolet light than falls on the open country.

Cities have more fog than do the open spaces around them. And it rains about 10 per cent more in cities than in the sur-

rounding areas. Actually, there is a small reduction in the frequency of rain on Sundays and holidays, which is a pretty good indication that the smoke produced by industry, providing condensation nuclei for raindrops, is involved. There is less smoke on the weekend because there is less industrial activity, and therefore less rain.

A city makes its own temperature regime, mostly by keeping the night warmer. The concrete pavement of the city soaks up the heat during the day and releases it at night so that the nighttime minimum temperatures are actually higher. The frost-free season in Chicago, for example, is 197 days, while in the surrounding counties it's only 167 days. That makes a whole month difference from the last frost in the spring to the first frost in the fall.

As cities grow, the portion of the earth's surface over which the climate is modified gets larger and larger. The effect of waterproofing the surface is starting to spread out into the open countryside also. An interesting little piece of research that you can do for yourself is to look up how many miles of highway there are in the United States, then take an average width for the highway, and compare the square miles of highway with the area of the United States. You'll find that about 1 per cent of the United States is paved.

OUR scale of inadvertent climatic modification is now up to hundreds of square miles. Now let's take a scale of hundreds of thousands of square miles, say half a million square miles, and see if there has been any inadvertent climatic modification. On this point, I cannot refer you to an extensive body of literature because there isn't very much. There are a few comments on the effect of deforestation. A few people say that the Near East, from Israel to Baluchistan, hasn't always been as desert-like as it now is. They say that sometime in the past, human activity destroyed the plant cover on the surface of the earth, thus destroyed the soil and modified the climate. For each of the articles that says this is the case, I can show you another that says it isn't. This discussion has gone on for a long time, but little of the commentary is based on really thorough studies.

The University of Wisconsin has been conducting research in the Rajputana desert of northwestern India. In the southern part of this desert about four inches of rain falls per year—comparable to the rainfall of Yuma, Arizona. The northern part of the Rajputana (sometimes called the Rajasthan) receives about 15 inches of rain per year—comparable to Denver, Colorado.

This particular desert doesn't quite seem to fit the world pattern of deserts. Meteorological knowledge suggests that the Rajputana area ought to be semiarid, but not necessarily desert. If all the moisture in the air over northwestern India