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The New Utopia

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Throughout the history of civilization man has been intrigued by the possibility of remaking this unsatisfactory world into a better one—one formed in the image of his personal perceptions, aspirations, and values. In saying this, I do not have in mind the broad conceptualizations of philosophers and religious leaders, such as the Ten Commandments of Moses, the Golden Rule of Jesus, the Five Relationships of Confucius, the Four Noble Truths and the Noble Eightfold Path of Buddha, or other ideal standards of conduct that have exercised tremendous influence in a variety of very different cultures. On the contrary, I am referring to detailed plans for reordering the formal organization of the community, for spelling out the structure, the details of daily life, and the specific patterns of individual form and conduct. Exemplified early in Plato's *Republic,* such projects have, through the writings of Sir Thomas More, made the word *utopia* a commonplace conception in the languages of the world.

Plans for creating similar seats of "ideally perfect society and political life" (*1*) have come from a variety of sources. Literary men such as Samuel Butler (*2*) in England, Edward Bellamy (*3*) in the United States, and in a sense Cyrano de Bergerac (*4*) in France—to mention only a few—found means for describing the inadequacies of civilizations known to them and fertile outlets for their imaginations in the design of fairer worlds—in the pursuit of the perfect way of life, or in the words of Matthew Arnold, of "sweetness and light" (*5*) as a way of life.

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Until recently the architects of utopia have, perforce, found it necessary to accept man as he is and to satisfy themselves with manipulating his environment and his institutional relationships—primarily economic and political—as a way of remolding the world and, as the great son of the Persian tentmaker wrote, bringing it "nearer to the Heart's desire" (*6*). It will be recalled that Rousseau, in fact, took the position that man himself —*natural man*—is a noble creature, corrupted only by the artificial and degrading civilization imposed on him (*7*). The utopias of Rousseau and of his literary disciples such as Chateaubriand (*8*), were thus quite consistently characterized by a rejection of the artificial trappings of so-called civilized life and a return to primitive forms of existence.

Utopian Engineering by the Psychologist

Today, by contrast, the creators of a "brave new world" undertake their task with avowed capacity actually to remake man himself and thereby to achieve the states of *inner* and *outer* perfection which, in the past, were promised only in the afterlife. As illustrated in the satirical novel by Aldous Huxley (*9*), biology furnishes the mechanism for modifying inherent and supposedly inflexible characteristics of the individual by manipulation of the embryo itself; physiology and psychology provide the tools for early and complete conditioning of the individual to a man-made world of perfected order.

The application of such psychological tools for this purpose finds even more concrete expression in the creation of *Walden Two* (10), a new utopia designed by the outstanding American psychologist Burrhus F. Skinner. Here, with unbounded faith in the capacity of a science of human behavior to change such behavior, Skinner subordinates "natural man" to the socially adaptive and conforming influences of scientific methodology.

Skinner's approach to a new utopia is epitomized in the answer given by the founder of *Walden Two* to a question bearing on the failure of earlier attempts to establish perfected centers of community living. The crucial fault, he points out, was the absence of *psychological management.* "The cultural pattern was usually a matter of revealed truths and not open to experimental modification—except when conspicuously unsuccessful. The community wasn't set up as a real experiment, but to put certain principles into practice. These principles, when not revealed by God, flowed from a philosophy of perfectionism. Generally, the plan was to get away from government and to allow the natural virtue of man to assert itself. What more," adds Frazier, the fictional protagonist of the new utopia, "can you ask for as an explanation of failure?" (*10,* p. 129).

Beliefs underlying this approach find expression in Skinner's scholarly writings, particularly in his book *Science and Human Behavior* (*11*). It is here that Skinner commits himself to the view that the deliberate manipulation or control of cultural practices and human behavior is a necessary feature of any civilization and the road to progress toward a better way of life. It is here also that he formulates *survival* as a criterion in evaluating control practices. Likewise, the crucial role assigned to a science of human behavior in relation to controlled cultural change is made apparent in this text. "We have," he writes, "no reason to believe that any cultural practice is always right or wrong according to some principle or value regardless of the circumstances. . . . Science," he adds, "helps us in deciding between alternative courses of action by making past consequences effective in determining future conduct. . . . The formalized experience of science, added to the practical experience of the individual in a complex set of circumstances, offers the best basis for effective action" (*11,* p. 436).

It is noted by Skinner that experimentation involving control of cultural practices may yield findings that are distaste-

ful to Western thought, which has emphasized the importance and dignity of the individual and the philosophy—accepted, according to Skinner, by many schools of psychotherapy—that "man is the master of his own fate" (*12*, pp. 44–68). "If," he concludes, "science does not confirm the assumptions of freedom, initiative, and responsibility in the behavior of the individual, these assumptions will not ultimately be effective either as motivating devices or as goals in the design of culture. . . . We may console ourselves with the reflection that science is, after all, a cumulative progress in knowledge which is due to man alone, and that the highest human dignity may be to accept the facts of human behavior regardless of their momentary implications" (*11*, p. 449).

Implicit in this quotation is the view that this approach involves no value judgments by the scientists who conduct experiments in controlling cultural design and modifying human behavior. In fact, Skinner elsewhere states explicitly that "our problem is not to determine the value or goals which operate in the behavior of the cultural designer; it is rather to examine the conditions under which design occurs" (*11*, p. 433). However, it does not seem clear, at least to me, that Skinner has adhered to this position. In spite of his assertion to the contrary, the choice of survival as a criterion for evaluating control, and the choice of a science of human behavior as mediating mechanism in deciding with respect to alternative courses of action, appear very clearly to be value judgments. Furthermore, with the literary license allowed to the novelist, Skinner in *Walden Two* has exercised wide latitude in this respect and thereby has revealed the dangers that arise when, in a life situation, the psychologist does, in fact, implement the view that his science makes him the architect preeminent of the utopian way of life.

There occurs, for example, a discussion of the community educational program. A visitor, named Castle, raises a question concerning student motivation. "Why," he asks, "do your children learn anything at all? What are your substitutes for our standard motives?"

To make clear the issue under consideration requires, unfortunately, a somewhat lengthy quotation from Skinner's novel, which goes on as follows (*10*, pp. 101–102).

" 'Your "standard motives"—exactly,' said Frazier. 'And there's the rub. An educational institution spends most of its time, not in presenting facts or imparting techniques of learning, but in trying to make its students learn. It has to create spurious needs. Have you ever stopped to analyze them? What are the "standard motives," Mr. Castle?'

" 'I must admit they're not very attractive,' said Castle. 'I suppose they consist of fear of one's family in the event of low grades or expulsion, the award of grades and honors, the snob value of a cap and gown, the cash value of a diploma.'

" 'Very good, Mr. Castle,' said Frazier. 'And now to answer your question—our substitute is simply the absence of these devices. We have had to uncover the worth-while and truly productive motives. . . .'

" 'We made a survey of the motives of the unhampered child and found more than we could use. Our engineering job was to preserve them by fortifying the child against discouragement.' . . ."

Following a description of the use of "conditioning" in building up tolerance to discouragement, the founder of *Walden Two* goes on to say, " 'Building a tolerance for discouraging events proved to be all we needed. . . The motives in education, Mr. Castle, are the motives in all human behavior. Education should be only life itself. We don't need to create motives. We avoid the spurious academic needs you've just listed so frankly, and also the escape from threat so widely used in our civil institutions. . . We don't need to motivate anyone by creating spurious needs.' "

Skinner uses here, of course, a device commonly employed by both literary men and expert propagandists in lulling the reader into at least the provisional acceptance of his viewpoint. It is that of molding attitudes by the choice of appropriate adjectives, illustrated in the quotation by the phrases "the snob value of a cap and gown," "the cash value of a diploma," and most of all by the repeated reference to "spurious needs."

Social Science and Social Reform

The last of these phrases, "spurious needs," brings into relief the situation that has produced both the title of this address and its content. This, briefly, is the increasing tendency on the part of the psychologist to inject value judgments in a manner that makes it increasingly difficult, especially for the layman, to determine when the psychologist is dealing with facts and principles derived from experiments, or when he is merely presenting his own value judgments (*13*). It has, in other words, become increasingly difficult to know when the psychologist speaks with the authority of science, or when he is playing the role of the social reformer while clothed—or even disguised—in the garb of the scientist.

In saying this, I am, naturally, not denying the right of the psychologist to his opinion—to his own value judgments. He, as every other free man, is entitled to believe that a cap and gown is, indeed, a stigma of snobbery; that a diploma is prized only for its cash value; that money is crass; that, as Rogers believes, religion, and also Freud, are to be criticized for permeating our culture with the false concept that man is sinful (*12*); that prejudice and discrimination are used by dominant groups to defend their vested interests (*14*), and so forth. As a citizen, the individual psychologist is free to express any such opinion, regardless of how unpopular it may be among his professional colleagues or among the mass of people in the culture of which he is a part. It is not his privilege, however, to clothe the source and personal nature of such opinions in the language or form of scholarly writing to the point where it would appear that they are the outcome of scientific inquiries.

Reference to *Walden Two* as a device for presenting this issue does not reflect the opinion that Skinner has been particularly remiss in this respect, in comparison with other psychologists. This fictional representation of his personal views by a notable and conscientious scientist merely provides a springboard for the discussion of a major issue in psychology. It is an issue that grows in significance with the multiplication of publications where the failure to distinguish between conclusions supported by experimental evidence and those representing personal value judgments becomes a medium for the support of cultural practices or changes deemed to be desirable by the scientist.

The frequency with which this occurs lends support to the opinion that many psychologists have reverted to Plato's conception of method, as stated in *Phaedo,* namely, "This was the method I adopted: I first assumed some principle, which I judged to be the strongest, and then I affirmed as true whatever seemed to agree with this . . . and that which disagreed I regarded as untrue." The fact that, in most instances, the individual psychologist is not engaged in the patterning of an entire utopia, but rather in what Popper in *The Open Society and Its Enemies* (*15*) has called "piecemeal social engineering," does not diminish the seriousness of the situation under discussion, especially in an era that has raised the psychological expert to a level of considerable influence.

Essays in Piecemeal Social Engineering

Many examples of this situation can be cited. A thought-provoking article by Gardner Murphy, entitled *Human Potentialities,* furnishes one such illustration. Here, Murphy formulates five basic principles for "permitting the discovery

of human potentialities," including among these, as a negative principle, *to avoid the competitive*. "Not," he wrote, "because competition is always bad, but because it frustrates and benumbs those who fail, and because for those who succeed it can at best give only the ever iterated satisfaction of winning again and again. In this direction lies, of course, a convenient way of maintaining a status minded society; but I am speaking of something quite different, namely, the release of human potentialities" (*16*).

Accepting Murphy's statement that he is interested primarily in the release of human potentialities, there still arises the question whether there are, indeed, facts available to support the use of the word *principle* instead of *judgment* or *opinion* in the context of his statement. Furthermore, the reference to "status minded" society introduces at least an implication that "competition" is a socially undesirable practice, as well as a handicap to the full and healthy development of the individual.

Examination of the literature—particularly that of social psychology—indicates that competition is quite frequently treated as though it has been demonstrated with considerable certainty that this is a noxious cultural practice. In addition, by associating capitalism with competition, onus is reflected on the capitalistic system, as compared with other and, by implication at least, superior economic and social systems. Thus, according to Newcomb, the higher frequency of exposure to failure, threat, and insecurity that exists where importance is attached to competitive success makes it "no wonder that psychiatrists like Alfred Adler found feelings of discouragement and inferiority prominent in the neuroses of Western society" (*17*). In a somewhat broader context, Asch states the requirements that distinguish between a "society of atoms, each arrayed against all, organized on the predatory principle of *homo homini lupus* and one organized around the idea of a community of men." The former, it is made clear, is one built on the "calculation of private profit." Only an inferior brand of social organization can be anticipated from an "ego-centered thesis" that "describes the balance achieved in society as an uneasy and antagonistic mutual limitation of each by all" and that "reduces every trace of solidarity to the pattern of relations in the business market" (*18*).

How many facts, from how many studies, are available to support such judgments with respect to the individual and social roles of competition? Newcomb's reference to Adler's statement concerning the frequency of neuroses in Western (competitive and capitalistic) society merely raises again the perennial questions concerning what constitutes "neurosis"; concerning the amount and quality of research underlying psychiatrists' dicta, and even concerning the nature of the sample observed by the psychiatrist. The last of these questions is neatly disposed of in the reply given to the query "Whom has the psychiatrist been observing?" in a humorous but nevertheless challenging book entitled *How to Lie with Statistics*. "It turns out," it is pointed out, "that he has reached this edifying conclusion from studying his patients, who are a long, long way from being a sample of the population. If a man were normal, our psychiatrist would never meet him" (*19*).

Perhaps the situation with respect to research on competition versus cooperation is not quite as bad as this. However, the fact remains that studies bearing on the effects of competition on the individual and on groups are few in number. Furthermore, the size and nature of the samples involved in such studies, the restricted and frequently artificial settings in which they are conducted, the manipulation of theoretical concepts and experimental variables, and so forth, make it quite impossible to derive broad value judgments pertaining to the role of competition in social progress. Available experimental findings do not provide grounds for discarding lightly the opinion, expressed in a prophetic dissent by Justice Holmes of the Supreme Court of the United States, that competition (between groups as well as between individuals) is a social advantage since it "is worth more to society than it costs" (*20*). Certainly, the hypothesis that competition—reaching even the dimensions of conflict—contributes to individual and group progress cannot be abandoned. This, in fact, is the position taken with respect, at least, to the social role of conflict in industry by a number of contributors to a recent book, *Industrial Conflict,* edited by Kornhauser *et al.* (*21*).

This reference to industry brings to mind another illustration of the presentation of value judgments unsupported by facts derived from research. There has been considerable thought given to the role of the union, in comparison with that of other social organizations, in providing "substitute" satisfactions for wants and needs that are presumably frustrated by the job conditions under which people work in modern industry. Writing within the context of a scholarly work, Krech and Crutchfield state with conviction that *"the labor union, by and large, can better meet most of the workers' needs and demands than can other organizations.* As we have seen . . . most social organizations will generally reflect the major needs of its members, and labor unions will therefore be more 'tailored' to the needs of the workers than will religious organizations or other less homogeneously composed social organizations" (*22,* italics mine).

In 1948, at the time this statement appeared, there was little available in the way of research findings bearing on the workers' perception of other social organizations (apart from the industrial plant) in comparison with their perception of the union. So far as religious organizations are concerned, there were not, to my knowledge, any facts that would support or disprove the conclusion reached by Krech and Crutchfield.

Studies conducted since 1948 do not show that workers themselves perceive the union as the prime medium for satisfying most of their needs. Thus, in a study of a teamsters union, by Rose, 75 percent of members referred to "getting higher wages," and 31 percent to getting "job security," as a purpose of the union (*23*). *No other single purpose is mentioned by as many as 20 percent of the workers involved.* Similar findings, in other studies dealing with the worker's perception of the union (*24*), likewise throw serious doubt on the view that the union does or can satisfy the needs for participation, for self-expression, for self-respect, for status, or a host of other psychological and social needs better or more fully than do other types of social organizations.

There is still little, if any, evidence bearing specifically on the question whether labor unions can or will be more "tailored" to the needs of workers than will religious organizations. It seems true, as Krech and Crutchfield contend, that unions are, in fact, assuming accessory functions of the type that enlarge the potential for the satisfaction of more and more needs of its members. As is also pointed out by Krech and Crutchfield, this is likewise true of religious organizations. They provide no evidence that one is doing this to a greater extent or with better results than the other. Furthermore, although current research on dual loyalties—for example, to the union and the religious organization—points to the fact that each organization may better satisfy some specified need, findings do not in any sense settle the question whether either is or can be better "tailored" to provide direct or "substitute" satisfactions for most needs.

In using this illustration, I am not, for the moment, concerned with the evaluation of the role of either the union or of religious organizations in the life of the individual and in modern society. I am concerned with treatment of the roles of these and of other social organizations by psychologists in a manner that confuses theory or value judgments with facts—in a manner that may, with or without intent, mold the attitudes of the

reader or student with respect to social institutions rather than enlighten him with respect to their roles as revealed by research. The finding, reported in a recent study by Keehn, that the resemblance within a group of well-known psychologists ($N = 27$) was confined to high homogeneity with respect to a continuum of "humanitarianism and anti-religionism" (*25*) perhaps lends special pertinence to the illustration under consideration.

Many illustrations of premature and also biased generalizations from relatively little in the way of facts are to be found in industrial applications of psychology that, as may be suspected, are of special interest to me. Thus, earlier discussions of the effects of repetitive work, and also current discussions of automation have suffered both from an absence of historical perspective and from the "naturalistic fallacy" in which subjectively determined goals and moral values are confused with the empirical methodology and outcomes of scientific research (*26*).

A necessarily brief illustration from another area of research and application may help to reveal the wide scope of the problems under discussion in this article. In a volume entitled *Motivation and Personality,* Maslow takes the position that "science is based on human values and is itself a value system" (*27,* p. 6). Acting on this premise, he has described a utopia, called *Eupsychia,* characterized by the fact that all men are psychologically healthy. Essentially, according to Maslow, this means that "the inhabitants of Eupsychia would tend to be permissive, wish-respecting, and gratifying (whenever possible), would frustrate only under certain conditions . . . and would permit people to make free choices wherever possible. Under such conditions," adds Maslow, "the deepest layers of human nature could show themselves with great ease" (*27,* p. 350).

Here Maslow appears to accept what Skinner has described as a dominant view characterizing the theory and practice of psychotherapy (expressed earlier in the primitivism of Rousseau), namely, that man is essentially good and kind and is corrupted only by social forces imposed from without. Thus, Rogers, the high priest of psychotherapy, takes issue with Freud's view (*28*) that man's basic nature—the *id*—"is primarily made up of instincts which would, if permitted expression, result in incest, murder, and other crimes" (*12,* p. 56). The contrary, Rogers contends, is the fact! "One of the most revolutionary concepts to grow out of our clinical experience," he writes, "is the growing recognition that the innermost core of man's nature, the deepest layers of his personality, the base of his 'animal nature,' is positive in character —is basically socialized, forward-moving, rational and realistic" (*12,* p. 56). The goal of psychotherapy therefore naturally becomes that of providing a client-centered, permissive atmosphere that leads to *adjustment* through the revelation—by the individual to himself—of the essentially "self-preserving and social inner core" of his personality (*29*).

Which of these views—that of Freud, or that of Rogers—can we accept as scientific truth? In what measure are the tremendous structures of psychoanalysis and psychotherapy built on a foundation of empirically established facts? And to what extent can we accept adjustment itself as a prescription for living "as a socially desirable goal?" Or is there justification for Lindner's view that the whole concept of adjustment "is a mendacious lie, biologically false, philosophically untenable, and psychologically harmful"—which, according to Lindner "disregards many if not all the pertinent facts of human nature" and represents "an untruth that is rendering man impotent at a time when he needs the fullest mastery over his creative abilities" (*30*).

The Scientist and His Moral Values

Whether this is true or not (*31*), the sad fact is that the immense superstructure of psychological practice often rests on a foundation of scattered, splintered, and tinderlike data that could fall apart with the most meager essays in the way of further exploration through the use of available scientific techniques. Psychologists and psychiatrists alike seem loath to acknowledge this. Only too often we seem possessed—not by an appropriate and deep sense of humility—but, instead, with an urge to substitute our value judgments—frequently uncontaminated by facts—for those held by others and as perhaps expressed by colleagues in related fields of economics, history, political science, philosophy, religion, and so forth. Like Scaphio and Phantis in the delightful comedy *Utopia Ltd.* by W. S. Gilbert, we seek to enter the world of affairs to the voice of a chorus that sings (*32*)

"O make way for the Wise Men!
They are prizemen—
. . . . . .
They're the pride of Utopia—
Cornucopia
Is each in his mental fertility.
O they never make a blunder,
And no wonder,
For they're triumphs of infallibility."

It is possible that in this paper—and also in my earlier publications—I may appear to have clothed myself in the mantle of the "wise man." It is unquestionably evident that much if not all that I have said here is in the nature of value judgments. In fact, I make no claim to the scientific authenticity of my judgments. Furthermore, this article does not purport to set up a scientific system of moral values, or even to support the position that this can be done.

Nevertheless, moral values are involved, and these require serious thought whenever psychologists turn their attention to newer developments in the way both of the theory and applications of the science of human behavior. This seems the occasion to recall the description, by Pliny, of the activities of the clothiers of Rome who met in the Forum in the autumn of each year and whose activities made *caveat emptor*—let the buyer beware—the expression of bitter experience on the part of the Romans (*33*). The very fact that the infant science of human behavior can already make important and useful contributions to human welfare does not entitle us to play the role of the architects preeminent of the new utopia.

We are not privileged to let our individual moral values—instead of hard facts—set our standards of conduct as scientists. We cannot conscientiously permit even a despair of finding ethical absolutes to lead us, in the words of Kecskemeti, to "smuggle them in behind intellectual, psychiatric, and political screens" (*34*). There is no time better than now to recall the forceful appeal by A. V. Hill that "scientists should be implored to remember that, however accurate their scientific facts, their moral judgments may conceivably be wrong" (*35*). Let us take pride and courage in the dedication of our work as scientists to the cause of mankind—to defending and enhancing the worth of the human being (*34,* p. 371). We must, nevertheless, simultaneously keep constantly in mind the necessity for clearly separating our thinking and wishes with respect to ordinary affairs from the "critical habits of thinking" (*35*) that characterize the true scientist and establish the inherent integrity of a science.

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13. It is apparent that I here (as also elsewhere in this paper) distinguish between *fact* and *value* and, at least by inference, reject the view, appearing in current discussions of theory of knowledge, that facts are in themselves value judgments. Actually, I do *not* accept the view that *existential* and *normative* propositions are equivalent—that *scientific* and *ethical* statements are basically similar [G. Lundberg, "Semantics and the value problem," *Social Forces* 27, 114 (1948)]. By contrast, I am inclined to accept the view, as expressed by C. Kluckhohn, that although existence and value are intimately related and interdependent, they are—"at least at the analytical level — conceptually distinct." However, a detailed discussion of this controversy is not appropriate in this paper. The reader interested in a detailed discussion of theoretical considerations in this area is referred to publications cited here, particularly reference 26, and, in addition, to a chapter on "Values and value orientations in the theory of action: an exploration in definition and classification," by C. Kluckhohn *et al.*, in *Toward a General Theory of Action*, T. Parsons and E. A. Shils, Eds. (Harvard Univ. Press, Cambridge, Mass., 1951), pp. 399–433.
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Evidences of Climatic Change from Ice Island Studies

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Arctic Ocean ice islands were located by the 58th Reconnaissance Squadron of the U.S. Air Force in 1946 during routine weather flights (*1*). One of these islands, T-3, was occupied by the Air Force for the collection of meteorological, oceanographic, and geophysical data (*2*) from March 1952 until May 1954. The size of T-3 is about 11 by 5 miles, its thickness is about 170 feet and, except for the annual snow layer, it consists of ice of density 0.89 to 0.92 grams per cubic centimeter.

Surface dirt, various plant and animal samples, and the presence of morainal material give evidence that this island was at one time near land. It was probably part of the ice shelf, the remnants of which are still present along the shores of northern Ellesmere Island. During 1952 and 1953, cores were obtained through the upper part of the island; numerous horizontal dirt layers containing widely differing amounts of dirt were found. The dirt in the layers was collected from one of the deep holes, and weights were obtained for all except the smallest layers. The weights are shown in Fig. 1. From this figure, it can be seen that a large surface dirt layer is present, and below this, in the first 90 feet of ice, there are about 85 layers containing widely varying amounts of dirt, but all containing considerably less than the layer at the surface. Near 90 feet, a very heavy layer is found that contains an approximate weight of 5 to 6 times that of the surface layer. The ice was cored for 20 feet below this layer and found to be free of dirt.

Preliminary petrologic studies of the ice character have established that the top part of the island is iced firn formed from snow, and that the lower part below the dirt layers is partly ice firn and partly sea ice. Although ice with glacial textures, associated with much morainal material, was found in one area on the island, the main parts of the island and of the shelf are not believed to be of glacial origin.

In two areas on opposite ends of the island, very heavy dirt layers were exposed at the surface of the ice. Studies of the ice character showed that these exposures resulted from the outcropping of the dirt layer found at 90 feet in the cored hole located between these areas. The weight of this heavy dirt layer was determined from the deposit on the 4.4-square-meter surface of a pit near the outcrop. The weight of the sample of dirt found at 90 feet in the cored hole was extrapolated for comparison with the larger sample and the two weights agreed within the limits of accuracy of extrapolation. The weight of the top dirt layer was also obtained from surface pits. Values for all intermediate dirt layer weights are extrapolated from the weights found in the 3-inch diameter core.

The dirt of the surface layer occurred in globules up to a few inches in diameter located in holes generally 2 to 3 inches below the ice surface. During surface-ice ablation, such as was noted during the two summers at the island, the dirt in the holes melts the ice under it and keeps an approximately constant distance below the ice surface. Thus it is protected from drainage runoff. Some in-

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