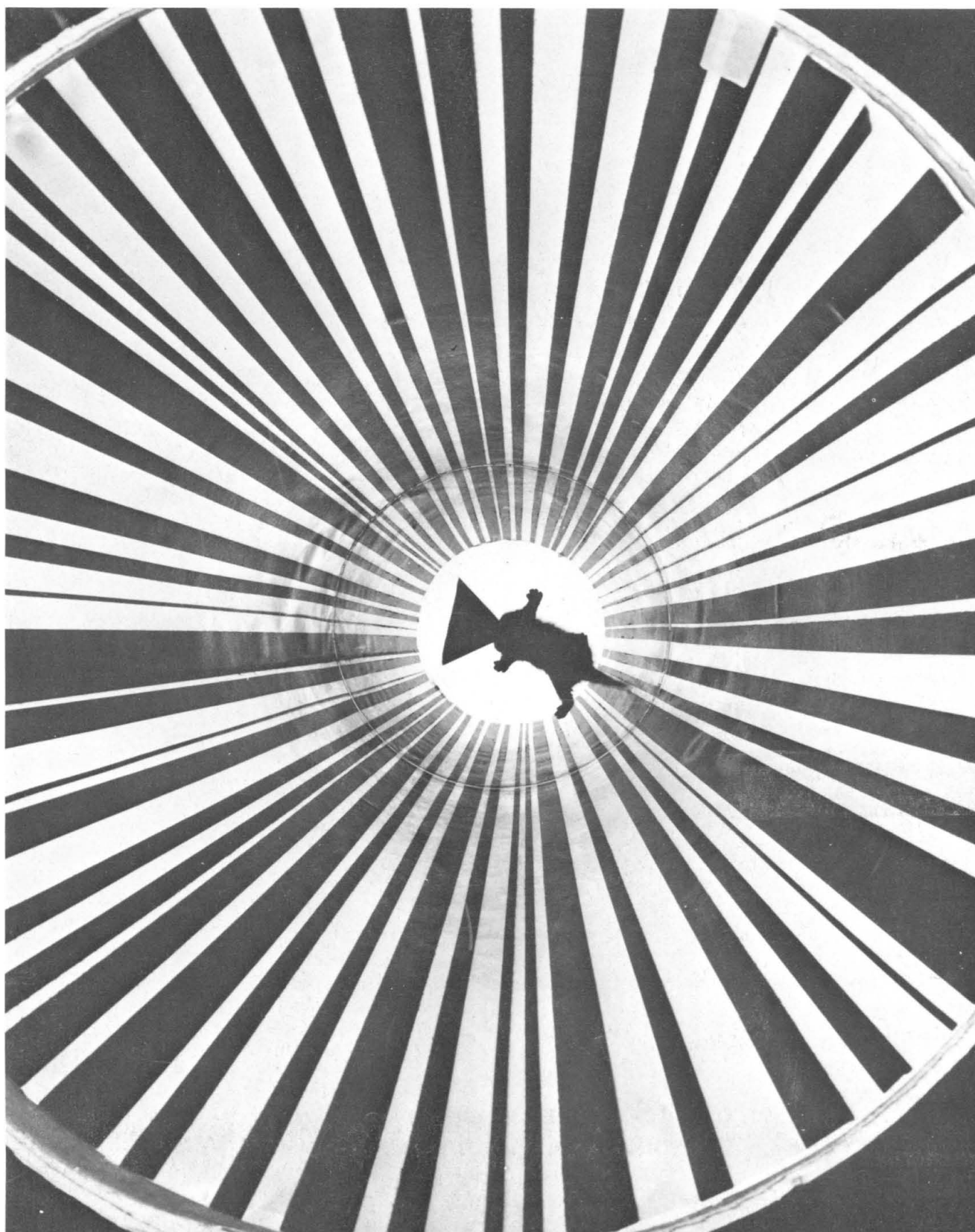


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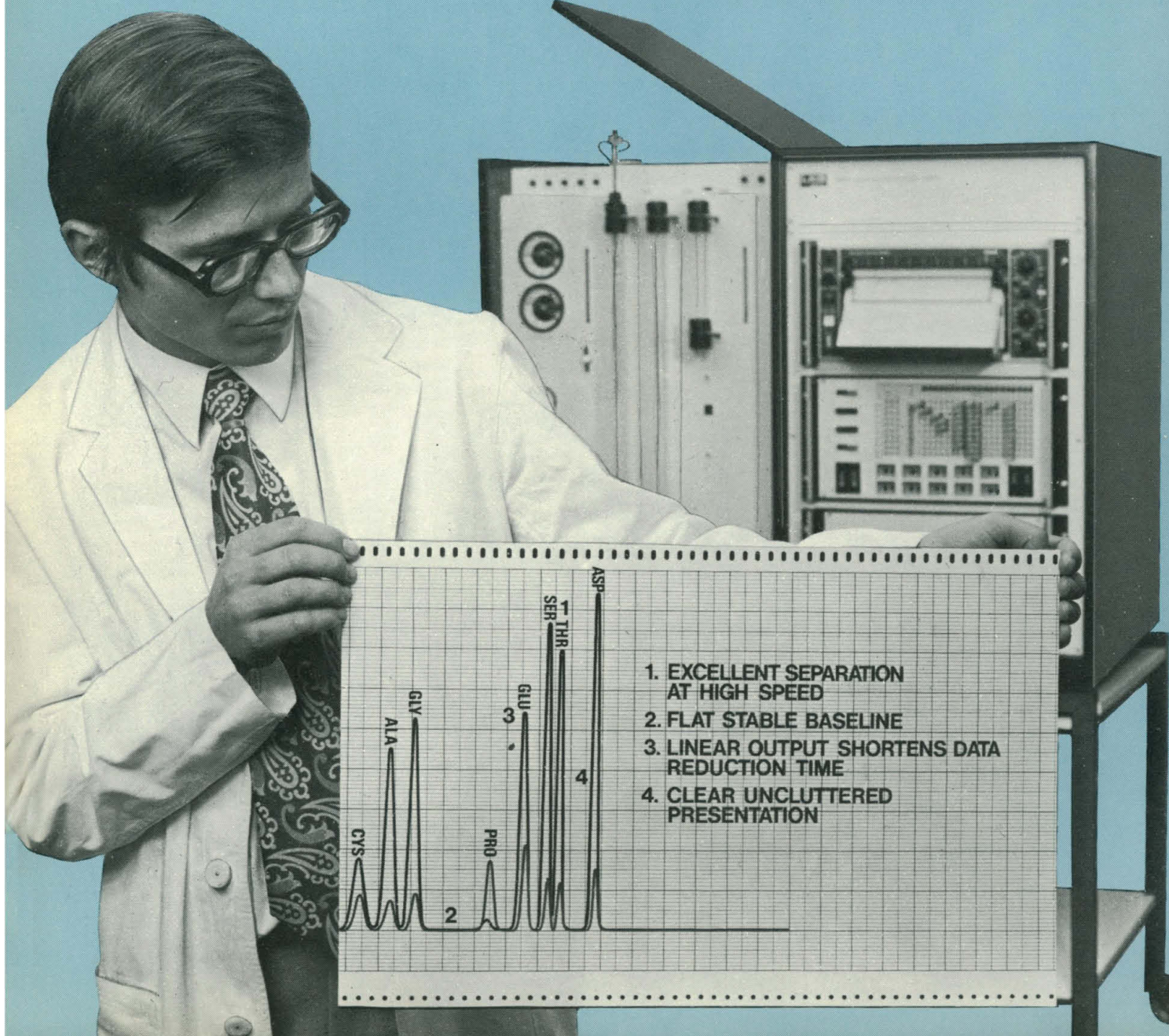
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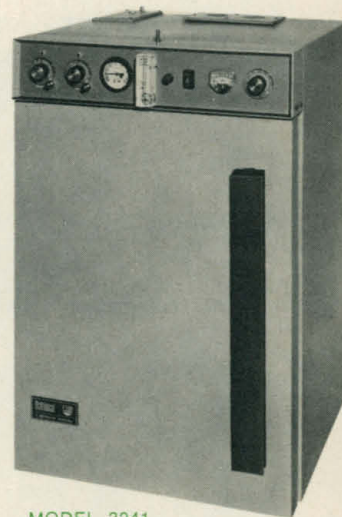
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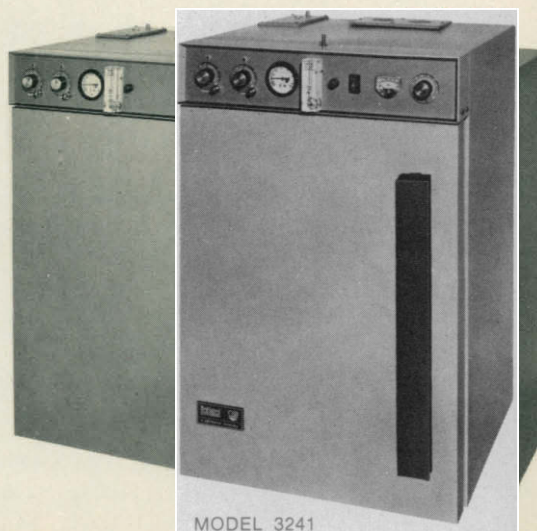
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Kittens reared during the first few months of life in a visual environment composed almost entirely of vertical stripes later exhibit an abnormally low acuity for horizontal gratings. See page 420. [D. W. Muir and D. E. Mitchell, Dalhousie University, Halifax, Nova Scotia, Canada; photograph courtesy of F. Stefani]

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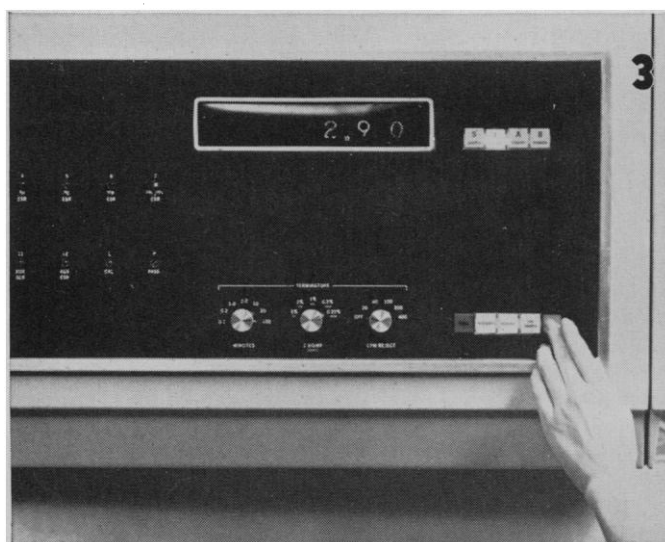
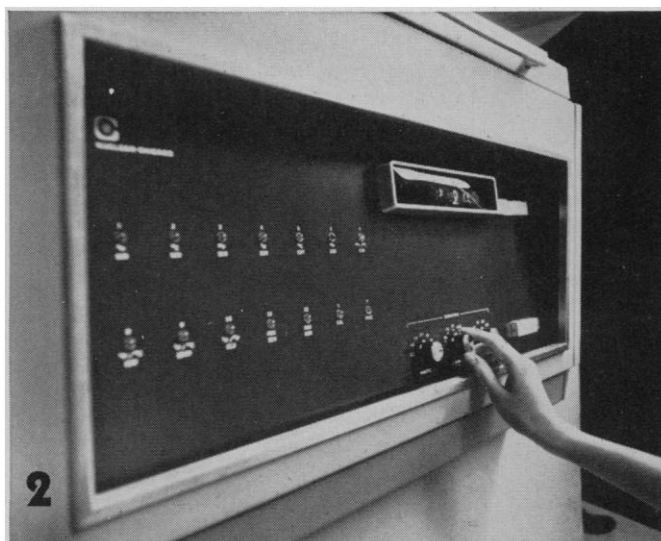


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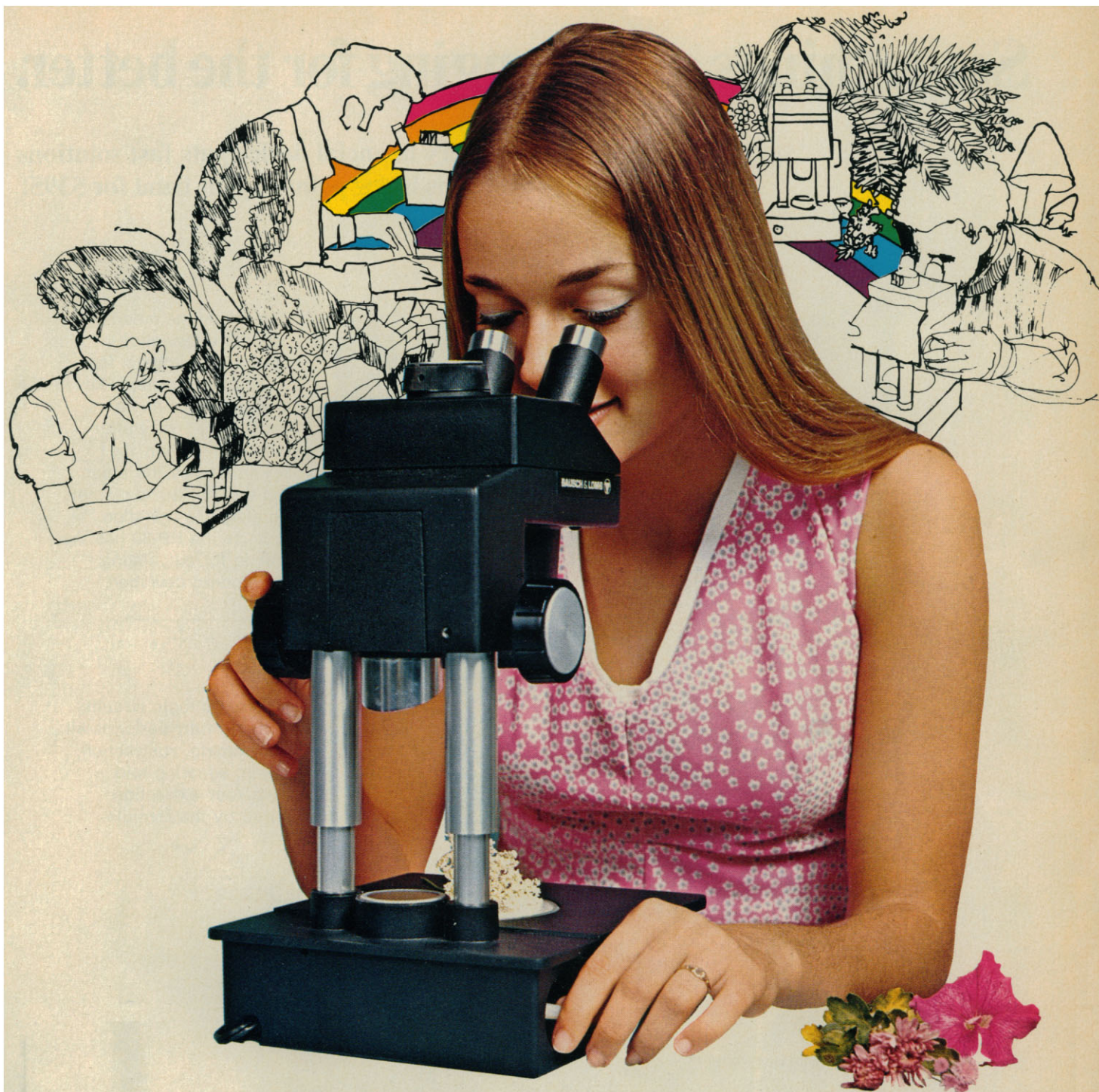
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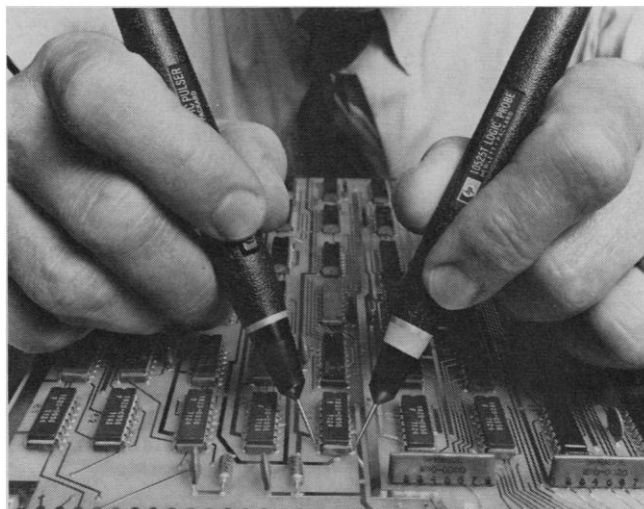
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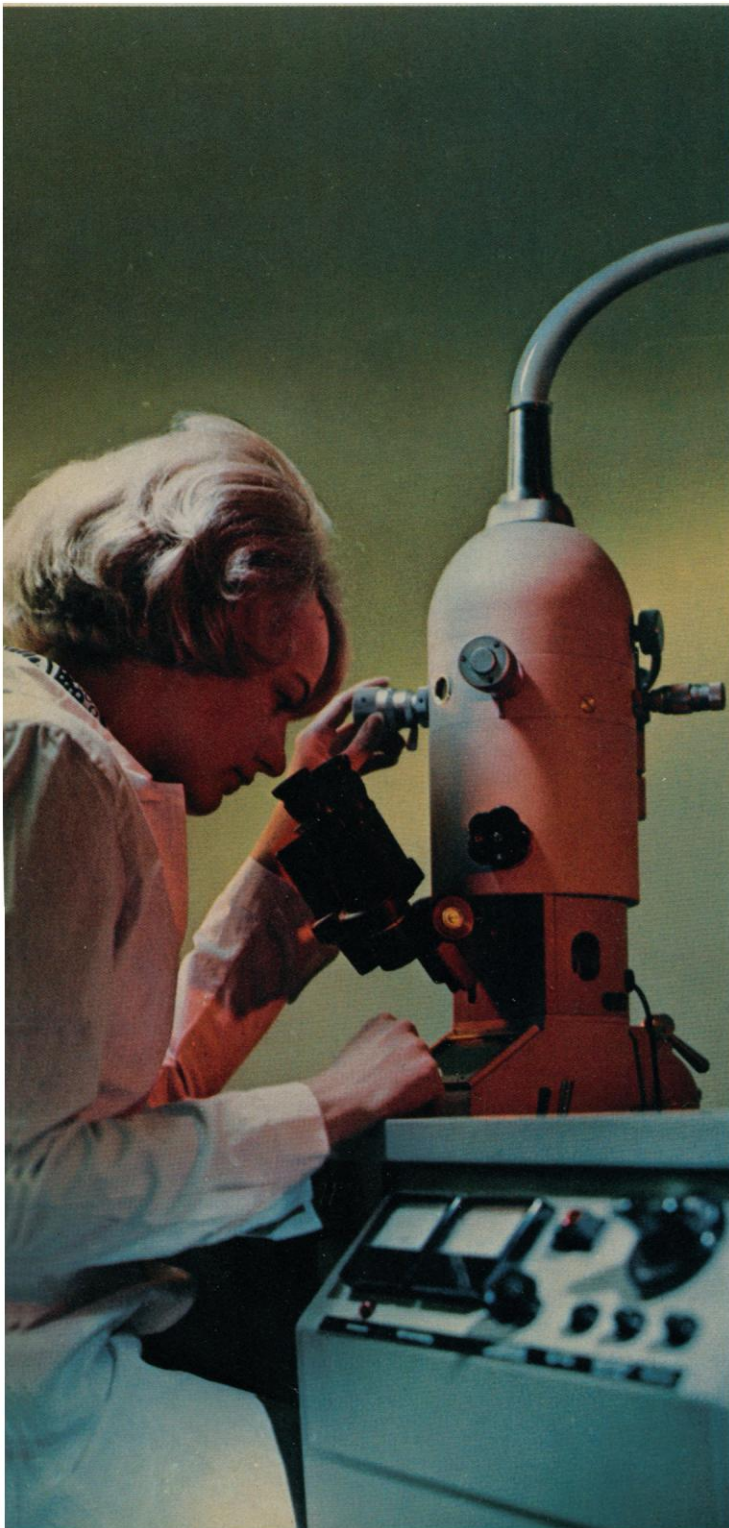
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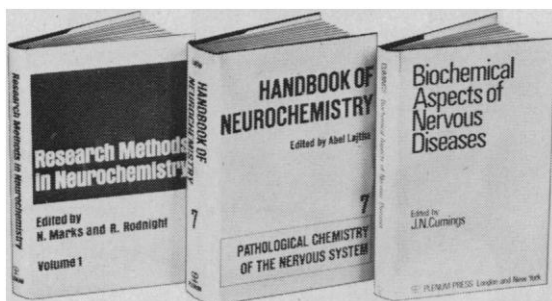
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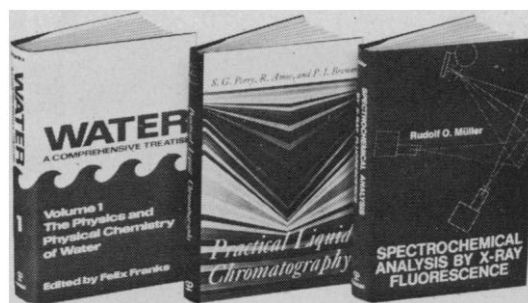
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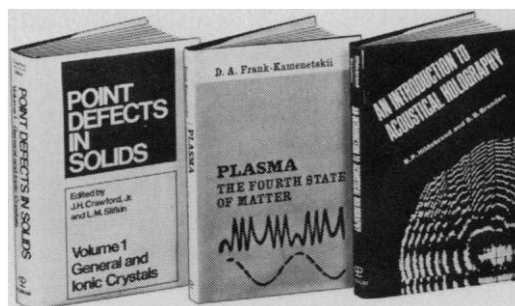
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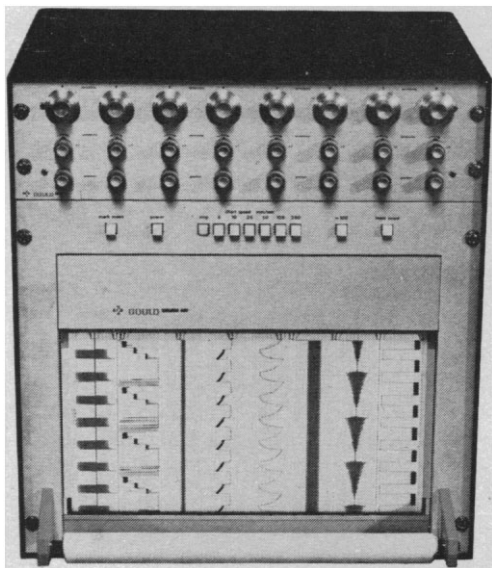
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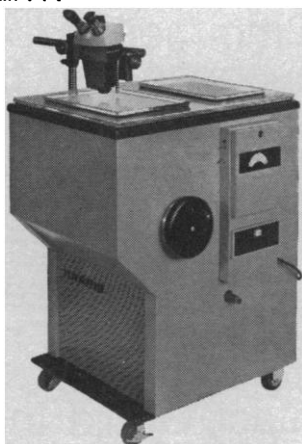
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procedure, expert clinicians would be likely to order urine assays for hallucinogens, a neurological consultation, skull x-rays, and electroencephalograms in these cases. Careful interviews with the families and friends would have been conducted, since drug and alcohol abusers are notorious deniers.

One feature of the mental-status examination, namely, the hallucination of voices saying "thud," would have indicated intense case study. In 20 years of experience with hospitalized mental patients I have never encountered this hallucinatory content, nor read of it; experienced colleagues concur. How this unusual finding escaped interest is, as Rosenhan points out, puzzling.

If the organic work-up produced no conclusive positive findings, the clinician who failed to consider malingering in these cases would be considering schizophrenia. However, any psychiatrist trained in psychodynamics would be searching both for current precipitating interpersonal factors and severe early life traumas; the failure to find these would have created an urgent need for clinical psychological testing and, once again, interviews with family and friends.

No indication that any of the foregoing procedures were carried out is given in Rosenhan's article. . . .

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. . . If complaints of isolated auditory hallucinations are believed by the doctor, they can require neurological investigation including lumbar puncture, skull x-ray series, and radioisotope brain scans. None of these procedures is without risk to the patient, but the risk is less than leaving undiagnosed brain disorders that can give rise to isolated hallucinations. One wonders if the volunteers for this reckless experiment were informed of this risk. . . .

JOHN HANLEY  
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. . . Simulation is a challenge to the diagnostician in every area of medicine in which diagnosis rests primarily upon reports of subjective experiences, as it does, for example, in the case of angina pectoris, chronic neuralgia, or headache. Where there is something obvious to be gained by the simulation,

such as compensation for injury or disability insurance payments, the examining physician is wary, though seldom able to make the distinction between the real and the simulated definitively. Since the psychiatrist deals with disease manifest primarily in subjective sensation and secondarily in overt behavior which he seldom has the opportunity to witness directly, mental illness can easily be simulated. That an illness can be successfully simulated does not make it any less "real" than one which cannot. . . .

Rosenhan claims that the only abnormal findings presented by his experimental subjects was the complaint of having heard voices. Review of his procedure discloses the presentation of at least two other phenomena which are ordinarily signs of illness. The first is the fact that the simulators sought admission to psychiatric hospitals. It is so rarely that this is done by anyone who is not indeed mentally ill that that alone must be taken seriously by a conscientious admitting psychiatrist as suggestive of illness.

Second, the voluminous note-taking which Rosenhan describes is a common occurrence among patients in mental hospitals. He expresses surprise that the hospital staff was not made suspicious by it. If anything, this note-taking would make the simulators seem more like compulsive paranoid patients than otherwise. . . .

I suspect that had these simulators applied for private care, most psychiatrists would have observed them without hospitalizing them. . . . However, the admitting room psychiatrist is not in private practice, and an admitting examiner who refuses hospitalization to an individual seeking it and presenting at least suspicious symptoms may face legal difficulties should the patient then commit suicide or homicide. Legal complications aside, there is considerably less harm done by admitting a patient who does not require hospitalization than by turning away one who does. . . .

A mental illness is not a diagnostic label; it is a pathologic process with its own natural history. . . . There is an important difference between sleep-induced or drug-induced hallucinations on the one hand and hallucinations of schizophrenia on the other. The difference is that when the period of sleep or of drug intoxication is over, the hallucinations and the behavior alteration associated with them will disappear. Once the diagnosis of schizo-

phrenia has been correctly made, we may anticipate that during the rest of that patient's life he will be in danger of recurrent attack. . . . That the specific details of the subsequent course cannot be predicted is less important than the fact that the odds of recurrent or continuing difficulty in a schizophrenic individual are orders of magnitude greater than they are in the general population. Rosenhan may claim that it is the process of labeling which exerts such a deleterious effect upon the individual's life. The practicing psychiatrist, on the other hand, will at once be able to call to mind many patients whom he has seen in second or third attacks of schizophrenic illness whose first attacks were not recognized or diagnosed. . . .

MORTIMER OSTOW

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. . . What Rosenhan must wish to conclude is that the criteria for distinguishing sane from insane are not clear or unambiguous. This of course is a well-known fact. The question is, just how vague are the criteria? That in none of 12 cases was the phony patient spotted by the authorities gives the erroneous impression that these criteria are very, very vague. However, this is not necessarily borne out by the "data."

While it is true that psychosis is thought to "reside in" the patient (that is, the adjective "psychotic" is applied to a person), it is generally understood that the psychosis manifests itself only under certain conditions. The psychotic is not expected to be bizarre in everything he says or does. . . . The conditions on the ward are designed (rightly or wrongly) to make the patients manageable (hence to appear sane). Those whose psychosis is not suppressed are transferred from the admitting ward. Accordingly, a much more impressive demonstration of his point could be made by Rosenhan if he were to take obviously insane persons and, by giving them a new name and releasing them to a community where they were not known, successfully pass them off as sane.

That the pseudopatients were not diagnosed as sane is not surprising. These pseudopatients were not just sane persons; they were sane persons feigning insanity. From the experiment, then, the only accurate conclusion to be drawn is that presumably competent

judges cannot distinguish the insane from the sane-feigning-insanity when the judges are not aware of a possible reason for faking. While malingering is a diagnostic possibility, "researching" is not. A proper "control" condition would be to repeat the study with a regular medical problem. Send pseudo-patients with "low back pain" or "severe headaches" to physicians and see how many of them are detected as "researchers." . . .

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. . . The pseudopatients did *not* behave normally in the hospital. Had their behavior been normal, they would have walked to the nurses' station and said, "Look, I am a normal person who tried to see if I could get into the hospital by behaving in a crazy way or saying crazy things. It worked and I was admitted to the hospital, but now I would like to be discharged from the hospital." If the nurse displayed skepticism, it would have been quite easy to call on the telephone any number of persons who knew of the ruse and would quickly arrange for discharge.

Although I do not doubt for a moment that patients in mental hospitals occasionally receive beatings, I think it is a surprisingly rare occurrence. My association with mental institutions goes back to 1946, and for 2 years I lived in a mental institution as an extern; I have never known of a patient who was beaten. . . . In view of the extraordinarily provocative behavior of some patients and in view of the poor screening involved in hiring hospital personnel, it is surprising that more beatings do not take place. One might have given the same interpretation to the "pseudopatients" who saw beatings that in the novel *I Never Promised You a Rose Garden* (1) seem to have been a key factor in the patient's recovery from mental illness. The patient had witnessed another patient's being beaten. The therapist's response was: "Life is no bed of roses. There are persons in the world who will beat a weaker person. If you don't want to run the risk of being beaten and if you don't like to see others beaten, how come you are not working as hard as you can to get yourself out of this place?" . . .

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... Because the study of the phenomena of illness and its classification have been denigrated within American psychiatry, it is not surprising that individuals might be called schizophrenic even when their purported hallucinations are utterly atypical and other evidences of illness are absent. The emphasis on psychodynamic understanding of the sources of illness and on the uniqueness of the individual has so dominated psychiatric education that many American psychiatrists are scarcely aware that abnormal behavior is found in discrete, classifiable patterns. When psychiatrists differ in court, it is usually not about the diagnosis of illness, but about something as ill-defined as responsibility. In many training centers, residents in psychiatry are encouraged to write facile dynamic formulations, such as the one quoted in Rosenhan's article, but since these formulations are based on the sketchiest historical data it is understood that this is but an exercise.

The assertion that the diagnosis of schizophrenia written in a hospital record is a lifelong stigma has been repeated so often that one seldom hears scientific skepticism expressed about it. There has certainly been much question within psychiatry about the manner in which the term schizophrenia is to be defined. Those who apply the term widely do not understand what the fuss is all about, for many of their patients do quite well and appear to recover. Those who apply the diagnosis narrowly find that most of their patients do poorly, as did individuals with similar symptoms years before the label was invented, for it is the underlying illness, not the label, that accounts for the difficulties. The fact that the boundaries between normal and abnormal vary from culture to culture is cited in the article as an element of the proof that diagnosis of mental illness cannot be valid. But mental illness is diagnosed on the basis of definite criteria, not merely an impression of abnormality. Psychiatrists who have not mastered the criteria will of course make errors. ...

It is interesting that the author adopted a misconception shared by most hospital patients. This is the narcissistic belief that what the nurses record is the abnormalities of patient behavior.

Well-trained staff report, without evaluation, what they observe; the only criticism to be made of the nurse's report "exhibits writing behavior" is that it uses three words where one would suffice.

If patients "were viewed as interesting individuals rather than diagnostic entities, ... would we not *seek* contact with them ... ?" asks Rosenhan. To suggest that the diagnostic category so occupied the attention of the hospital staff that they could not respond to the individuality of their patients is to ignore what is known about institutions, roles, and even efficiency. People accept the fact that they can be guided along highways by traffic policemen who do not know their ultimate destination or motives for traveling, that they can be given money by bank clerks who do not know how they will spend it; but they hate to come up against the fact that in a modern psychiatric hospital they are likely to recover from a psychotic illness without ever telling a psychiatrist about their fears and hopes. The old-time doctor who sat by the patient's bed while he died was held in higher esteem than the physician of today who provides a prescription and then absents himself while his patient recovers. ...

Are people "stripped of their citizenship, their right to vote," and so on, by psychiatrists and by diagnosis of illness? If rights are lost, it is because of laws, not medical practice. The new mental hygiene law in New York State specifically states that treatment in a mental hospital will not cause anyone to be deprived of his civil rights. If every state enacted similar laws, there might be fewer instances of a legislative problem's being misdiagnosed as a medical one.

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... Rosenhan overlooks some obvious and important conclusions:

1) In this country it is increasingly easy to obtain psychiatric care, including hospitalization. Often one need only ask; the request is taken seriously, and bizarre or uncontrolled behavior is not required as further proof of need. Whatever the impact of this on scientific accuracy of diagnosis, the humanitarian aspects are obvious.

2) The psychiatric hospital is not a pleasant place for "normal" people.

This is perhaps appropriate: normals seldom want to get in, and it is probably good that they should want to leave soon. Few of those who are ill enjoy their hospitalization either, but many prefer the hospital environment with all its failings to any alternative available to them. They enter and remain voluntarily. I do not think one can accept without reservation Rosenhan's allegation that the hospital environment is "undoubtedly countertherapeutic." His lone scientific point is that "normals" don't like to be in a psychiatric hospital—a point I think no one doubted before reading his article.

3) The "medical model" of mental illness is moribund, at least where patient and hospital meet. Where the model survives in hospital records and official reports, its sustenance may well come from administrators and funding agencies such as insurance companies who expect to receive the reports. Insurers are notoriously reluctant to pay bills if the patient wasn't "really sick."

Rosenhan is puzzled because his pseudopatients were retained in hospital even though they were symptom-free and exhibited no abnormal behavior. Had he looked about him (at the "real" patients) his question might have been resolved, for many psychiatric wards are not marked by a great deal of bizarre behavior; behavioral abnormalities often decrease immediately on hospitalization or soon after. Subjective symptoms also are often relieved by hospitalization. Absence of symptoms while in a special environment does not necessarily mean absence of illness; a patient admitted for bleeding peptic ulcer may "feel fine" and not be bleeding 24 hours later—he has his ulcer still. . . .

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. . . Staff failure to change diagnoses and treatment modalities is, in my experience, most related not to their inability to distinguish changes in patient presentation from one day to the next but rather to investments made in the already established diagnosis and treatment plans. And staff avoidance of patient contact is probably related, at least in part, to the difficulties imposed by the nature of psychiatric illness itself. When I worked in internal medicine, I found the medical patients who stopped me in the ward corridors to

be no less "demanding" than I later found psychiatric ones to be. However, their demands could more easily be met by me within my physicianly role: I could usually inform them of their tentative or final diagnoses, of my current thinking about their illnesses, of the investigative procedure yet to be done, and of their prognoses. They frequently complained of symptoms (say, pain, or palpitations, or esophageal burning) which were quickly treatable with medications. Psychiatric illnesses requiring hospitalization are, as a rule, less well understood than most medical illnesses, and are often more chronic and socially debilitating. Most psychiatrists find it harder to answer the inevitable corridor questions raised by psychiatric patients: "What do I have?" "When will I be able to leave?" "Should I get a divorce?" "When will I stop feeling this way?" "When will this medication begin to work?" It seems to me, however, that facing patients, and trying to answer these questions as honestly as possible, difficult as they are, is far more important than avoiding them and the patients who ask them.

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. . . Rosenhan quite correctly states: "Staff shortages are pervasive, staff time at a premium. Something has to give and that something is contact." Nobody can disagree with this statement. It is almost the rule that the more severe the psychiatric condition the lower the staff-patient ratio and the less effective the treatment. A recent study at McGill again confirmed that tragic fact and suggested a restructuring of psychiatric services to establish optimal maintenance of treatment and rehabilitation (1). Space does not permit discussion of the needed reorganization of psychiatric services throughout the United States and Canada. No reorganization is altogether possible if, in response to some fashionable doctrines, the reality of psychological disorders is denied altogether. The problem is not that psychiatric hospitals are "insane" places, but that many of them are inadequate. This makes it, of course, impossible to provide adequate diagnosis and care to psychiatric patients.

Rosenhan says that "while financial stresses are realities, too much can be made of them." This statement is ab-

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solutely incorrect. No medical or psychiatric care can be properly administered without proper financing; this applies, as has been disclosed on many occasions, not only to psychiatric patients, but also to the mentally retarded, to the disabled, to geriatric patients, and to many others suffering from chronic conditions. But let us simply state the facts about expenditure for psychiatric patients as compared to expenditures for other patients: In 1970,

the average daily expenditure in public mental hospitals was \$14.89 per patient per day, with one state spending as little as \$5.80 per day. Veterans Administration hospitals spent \$30 per patient per day and private psychiatric hospitals about \$48. These amounts usually include the expenditure for medical and psychiatric treatment. During the same period, general hospitals spent about \$80 per patient per day (2). This does not include doctors' fees. . . . These

financial facts alone account for staff shortages, poorly trained and insufficient, even though well-meaning, professional personnel, and the type of attendants described by Rosenhan. . . .

The fact that any nomenclature which categorizes or applies to mental functioning eventually becomes a derogatory term or label is well-known—"idiot," "moron," and "imbecile" were coined as scientific terms but eventually became a form of invective and had to be replaced by "mentally retarded." Yet no scientific approach to physical or mental illness is possible without a nomenclature, unless one is willing to give up a scientific approach to illnesses altogether. Psychiatric nomenclature is not uniform and includes etiologic, psychodynamic, and even sociological aspects of mental and behavioral disorders. Yet the attack on psychiatric nomenclature as some kind of pernicious "labeling" comes very close to a denial that any mental disorders characterized by objectively ascertainable symptoms, behaviors, and tests altogether exist. In the not so distant past, "tuberculosis" and "syphilis" were words shunned by polite society. Fortunately this did not deter physicians and researchers from diagnosing and treating these conditions. If, as Rosenhan advocates, we avoided psychiatric diagnoses, labeled by him as labels, and replaced them by focusing "on specific problems and behaviors," then the verbal designations of these problems and behaviors would become labels, too. . . .

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. . . Rosenhan calls for more research. But the social psychology of mental institutions has been a major research field for 20 years. What Rosenhan describes we have known in exquisite theoretical and practical detail for over a decade. But he ignores the psychology of institutional change. Knowledge, per se, does not produce change. Goffman's classic research on total institutions was conducted at a famous hospital. When I interviewed staff at that hospital some 10 years after Goffman, most knew of his book (1), most did not know it was a study of their hospital, and nothing



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ing had changed in the hospital in the 10 years.

Rosenhan suggests that if we do not send people to insane places our impressions of them are likely to be less distorted. Here he assumes that psychiatric hospital units are inevitably bound to a gross distortion process. That is an assumption that can be empirically tested. There is abundant evidence to indicate that organizational change is possible to redress the distortions Rosenhan describes (2). His alternative is to retain disturbed persons in their communities for treatment, where a "non-pejorative environment" can be provided. His support for community treatment programs is certainly consonant with theoretical and therapeutic concepts of the day, but his rationale is not supported by evidence that the community is nonpejorative. The disturbed or deviant person is labeled as such before he comes to the psychiatric hospital, not after (3). . . . Cumming (4) has done a brilliant social role analysis of the total human services system in a community which demonstrates the same phenomena Rosenhan describes in the hospital. . . .

The Rosenhan article implies that the problems lie solely with the mental health professions and psychiatric institutions. But institutions and professional practice exist in reciprocal relation to public attitudes and public demands. Inhumane institutional practices in part reflect the demands and expectations of the society. The rejection and dehumanizing of the psychiatric patient within the institution can be seen as a projection and acting out of the community rejection and dehumanization of the labeled deviant (5). . . . The conclusions and recommendations that Rosenhan proposes miss the central issues and end up as scapegoating observations rather than as catalytic clarification.

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These letters deserve to be read with care. The issues they raise are important ones, and the feelings they convey need to be appreciated if one is to get a sense of where the crossroads in psychiatry are today. However much I wish it were otherwise, the authors and I simply do not agree on the major counts.

"On being sane in insane places" described two largely separate issues: diagnostic practices in psychiatric hos-

pitals, and the experience of patienthood. Most of the comments are addressed to the first issue, and it is well that we review briefly the part of the study that is germane to that issue:

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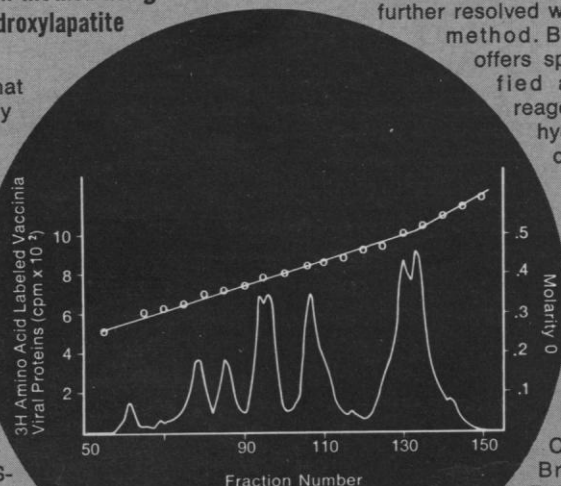
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ness "no further alterations of person, history, or circumstances were made. The significant events of the pseudopatients' life histories were presented as they had actually occurred. Relationships with parents and siblings, with spouse and children, with people at work and in school, . . . were described as they were or had been" (p. 251). Eleven of the pseudopatients were diagnosed manic-depressive. All were discharged "in remission." None was found sane.

The theoretical predicates for the research derive from the large literature on the effects of contexts on perception (1). Perception is clearly an active process. While we tend personally to believe that we can always disembed a figure from its ground, the fact of the matter is that the meaning and value that are attributed to a figure are in some part contributed by the ground. A book found on your desk is perceived to be more valuable than one in your wastebasket. A hand in the air has different meaning according to whether you are sitting in a classroom, making a right turn in your car, or marching in a German parade during the 1940's.

While we may think that in examining a patient we have disembedded him from the context in which he is found, that assumption is open to reasonable question and is in fact the basis for our study. A recent experiment by Langer and Abelson (2) may make the effects of context more clearly germane to the present case. They videotaped an interview in which discussions were focused on a client's job histories and difficulties, then asked well-trained psychodynamic psychologists and psychiatrists to rate the degree of adjustment of the client, telling half the raters that they were observing a job interview and the other half that it was a psychiatric interview. Those who thought they were watching a job interview rated the patient as much better adjusted.

With respect to diagnosis, the issue that is implicated in the study has apparently been widely misunderstood. The issue is not that the pseudopatient lied. Of course he did. Nor is it that the psychiatrist believed him. Of course he must believe him. Neither is it whether the pseudopatient should have been admitted to the psychiatric hospital in the first place. If there was a bed, admitting the pseudopatient was the only humane thing to do.

The issue is the diagnostic leap that was made between the single presenting symptom, hallucinations, and the diag-



nosis, schizophrenia (or, in one case, manic-depressive psychosis). That is the heart of the matter. Had the pseudo-patients been diagnosed "hallucinating," there would have been no further need to examine the diagnostic issue. The diagnosis of hallucinations implies only that: no more. The presence of hallucinations does not itself define the presence of "schizophrenia." And schizophrenia may or may not include hallucinations.

Lest the matter reduce to one scientist's word against another, let us look to the standard for diagnosis in psychiatry, the *Diagnostic and Statistical Manual (DSM-II)* of the American Psychiatric Association:

295. Schizophrenia. This large category includes a group of disorders manifested by characteristic disturbances of thinking, mood, and behavior. Disturbances in thinking are marked by alterations of concept formation which may lead to misinterpretation of reality and sometimes to delusions and hallucinations, which frequently appear psychologically self-protective. Corollary mood changes include ambivalence, constricted and inappropriate emotional responsiveness and loss of empathy with others. Behavior may be withdrawn, regressive, and bizarre. . . .

295.3. Schizophrenia, paranoid type. . . . characterized primarily by the presence of persecutory or grandiose delusions, often associated with hallucinations. Excessive religiosity is sometimes seen. The patient's attitude is frequently hostile and aggressive, and his behavior tends to be consistent with his delusions. . . .

But, you will say, "hallucinations" is not a diagnosis at all but merely a description. Indeed that is so, and as we shall soon see, those descriptions are all that may be warranted by the current state of knowledge.

The matter of psychiatric diagnosis is qualitatively quite different from what it is in general medicine. Diagnostic reliability in medicine is not perfect, but it has much more going for it than psychiatric diagnosis. Consider Blair's example of bleeding ulcers. It is the case, as Blair points out, that the bleeding can abate but the peptic ulcers remain. The presence of that ulcer, however, is verifiable independently of the bleeding. It is precisely because we can check urine, perform blood tests, palpate, examine reflexes, look inside, and more, that we are on considerably better ground in medical diagnoses than we are in psychiatry. To my knowledge, schizophrenia is not independently verifiable beyond what a patient says and does. Fleischman put it well: "Given our current ignorance of biochemical

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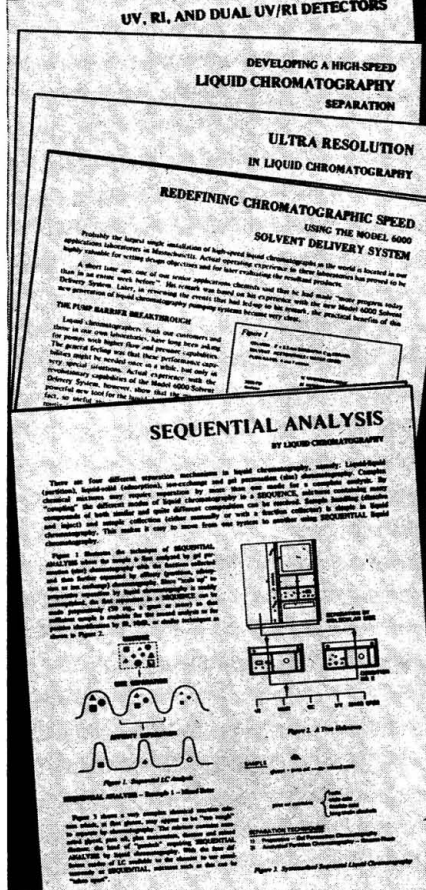
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As early as 1938, Boisen (3) pointed to the role of local convention in psychiatric diagnoses. He found that some 76 percent of patients were diagnosed hebephrenic schizophrenic in one Illinois hospital while only 11 percent were so diagnosed in another. Ash (4) found that three psychiatrists seeing the same male patients could agree on the diagnosis in only 20 percent of the cases. Agreement rose to 34 to 43 percent when two psychiatrists were diagnosing.

Examining the matter from a different angle, Zigler and Phillips (5) investigated the frequency of 35 common presenting symptoms among 793 hospitalized psychiatric patients. All 35 symptoms were found among both neurotics and schizophrenics, 34 were found among character disorders, and 30 in manic-depressives. With such overlap, how reliable or valid can diagnostic categories be? True, the investigators found many small relationships between specific symptoms and diagnostic categories, but the very triviality of those relationships itself underscores the magnitude of the problem of validity. The literature on the reliability of psychiatric diagnoses is large and spans more than three decades. Several extensive summaries are available (6).

It is tempting to disregard the data from our experiment and the earlier evidence and simply say that it is not diagnosis that has failed, only diagnosticians. We were ourselves tempted to that judgment during the early part of the study, before we had seen the spectrum of hospitals and diagnosticians that were included in the study. Let their characteristics speak for themselves. Eight of the 11 public hospitals conducted approved psychiatric residence programs, as did the private hospital. Three of the public hospitals were

psychological research, and especially in efforts that involve participating and observing simultaneously. But some things can be said to establish the potential limits of these distortions. First, when a pseudopatient was found to have departed grossly from the formal protocol, he was eliminated from the sample (as indicated in note 6 of the article). "Subtle" departures from protocol during the admissions interview, and subsequently, would of course not be reflected in the pseudopatients' notes—that is precisely the nature of experimenter bias. The possibility, therefore, cannot be dismissed. Note, however, that visitors' observations on the pseudopatients after they were admitted uniformly disclosed no departures from role in the direction of craziness. Moreover, the ease with which psychiatric diagnoses were questioned when a pseudopatient was expected (in the "challenge" experiment) raises some questions whether the "experimenter bias" was perhaps as much in the mind of the diagnostician as it might have been in the behavior of the pseudopatient.

On another matter, a writer questions whether the pseudopatients, several of whom had no previous experience in psychiatric hospitals, were capable of making the "complex" interactional observations reported in the article. In fact, those data were obtained in four hospitals by experienced researchers who had worked in similar settings. But that need not have been the case. Counting when and how often staff come and go from the "cage" hardly requires experimental know-how. Nor does asking standardized questions at fixed intervals and observing subsequent behaviors tax the skills of even a beginning researcher. These are quite simple matters, in fact.

SCIENCE, VOL. 180

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As to the reality of psychological suffering, I made my views clear at the outset of the paper, in the third paragraph: "... Nor does raising such questions deny the existence of the personal anguish that is often associated with 'mental illness.' Anxiety and depression exist. Psychological suffering exists. But normality and abnormality, sanity and insanity, and the diagnoses that flow from them may be less substantive than many believe them to be." Let me be perfectly clear about this: To say that psychological suffering is a myth is to engage in massive denial. But to imply, as Wiedeman does, that psychological labeling does not itself create suffering is to similarly engage in denial.

Some assert that the appearance of this paper can only hurt psychiatry. The possibility that it might help psychiatry, that sensitization to issues in diagnoses and treatment might lead to beneficial change, seems not to arise. For the record, let me make clear that the theory that underlies this effort, and the report itself, do not support the vilification of psychiatric care. Psychiatry may be less knowledgeable than it believes itself to be but that is hardly surprising when one considers the magnitude of the problems which it must address. In the closing paragraph, I wrote, "It could be a mistake, and a very unfortunate one, to consider that what happened to us derived from malice or stupidity on the part of the staff. Quite the contrary, our overwhelming impression of them was of people who really cared, who were committed, and who were uncommonly intelligent. Where they failed, as they sometimes did painfully, it would be more accurate to attribute those failures to the environment in which they, too, found themselves. . . . Their perceptions and behavior were controlled by the situation. . . . In a more benign environment . . . their behaviors and judgment might have been more benign and effective."

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### Communication among Scientists

The article by Griffith and Mullins, "Coherent social groups in scientific change" (15 Sept. 1972, p. 959) is complementary to a research project we are currently conducting. Communication among scientists should be of vital concern to all of us, as scientific endeavor is inextricably intertwined with the flow of information through the scientific community. We are specifically interested in the process by which "revolutionary" theories, data, and methods become known to researchers, and the factors influencing the impact of these new perspectives and information on the people concerned.

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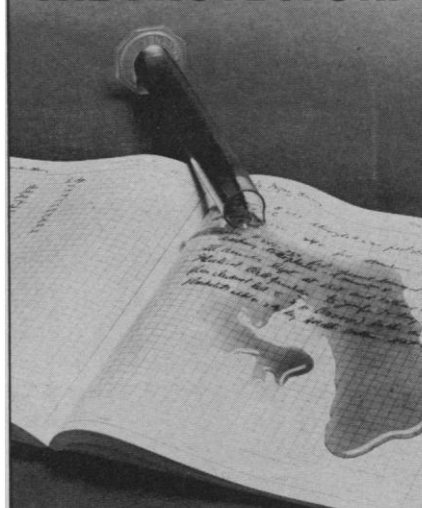
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In his letter to *Science* of 2 March (p. 856) Alvin M. Weinberg asserts that "an inexhaustible energy source is a necessary—not a sufficient—condition for mankind's ultimate survival." This confuses the needs of mankind with the needs of an industrial system that is devoted to the endless increase of color television sets and aluminum beer cans.

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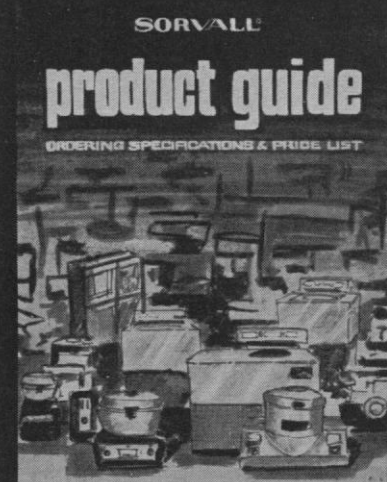
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### Hydrogen and Power

Near the end of his discussion of a "hydrogen economy," Bockris (23 June 1972, p. 1323) lists certain difficulties that would be faced in the establishment of such an economy. His concern about the public's fear of hydrogen is really no problem at all. The public already accepts a natural gas distribution system that spreads throughout the United States and the streets of most cities. Occasionally explosions and fires have been caused by gas leakage from this system, but, on the whole, the system operates both efficiently and safely.

A primary problem in Bockris' proposals could be the reluctance of the public to give up the convenience of the electrical distribution system that currently gives them essentially anything they want at the flip of a switch. Although a considerable amount of literature has appeared on the subject of fuel cells, they are not yet a part of the economy of the United States and no one really knows what problems would arise if we attempted to use fuel cells in large numbers to supply the power needs of individual homes.

Whether the difficulty Bockris lists as "conservatism" is really a problem depends on his definition of conservatism. If he is thinking of the economic inertia that is built into existing systems, then I agree. The power companies of the United States have billions of dollars invested in electrical distri-

bution systems, and they continue to build more as the demand for electric power increases. Since the supply of natural gas is decreasing, some experimentation by the gas companies appears to be the most practical way to determine whether the system he proposes could actually be made feasible on a commercial basis.

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Having easily available electrical power is a primary aspect of the hydrogen economy. Indeed, one of the few ways whereby we can easily have abundant electricity in the future is by using hydrogen as the medium for transporting energy from great distances (from large atomic reactors on floating platforms, or solar energy farms in remote locations). The hydrogen could be reconverted most efficiently by fuel cells, or it could be used to run internal combustion engines and local power houses.

The fuel-cell era of 1958-1968 ended when NASA developed fuel cells which it considered satisfactory for auxiliary power in space. There has been little progress since, especially in the conversion of hydrocarbons, because no substitute for noble metals has been found (1). It has also been difficult to find a cheap catalyst for fuel cells; one prospect is nickel.

The commercial feasibility of a hydrogen economy depends largely on the cost of hydrogen at the point where the power is used; this is the cost of energy at the source, plus \$0.001 per kilowatt hour per 1609 kilometers over which hydrogen is transported. Thus, an advantage of the hydrogen economy is that the original source could be several thousand kilometers distant, a useful aspect if the source is solar. Cost comparisons made in the past between new and conventional sources will have to be revised. In thinking of a hydrogen economy, we are thinking of the costs of fossil fuels at least 15 years from now. The indication is that the cost of energy from conventional sources will then be several times the present cost.

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Dr. R. Gallo & Dr. G. Todaro
- ☐ **Cancer Research III—Chemotherapy**  
Dr. C. Gordon Zubrod  
**Cancer Research IV—Immunology**  
Dr. Paul Levine
- ☐ **Cancer Research V—Environmental  
Agents** Dr. Umberto Saffiotti  
**Cancer Research VI—NCI Roundtable**

## ENERGY

- ☐ **Energy: A Critique**  
Dr. Dean Abrahamson  
**Puzzles of Air Pollution** Arthur Levy
- ☐ **Fusion: Prospects & Pitfalls—I**  
Dr. H. Furth & Dr. H. Forsen  
**Fusion: Prospects & Pitfalls—II**  
Dr. H. Furth & Dr. H. Forsen
- ☐ **Antidote to the Energy Crisis**  
George Long  
**Chemicals In the Environment**  
Dr. Samuel Epstein
- ☐ **Fusion and Fission: An Appraisal**  
Dr. James L. Tuck  
**The Prospects for Energy**  
Dr. M. King Hubert

## ENVIRONMENT

- ☐ **The Struggle for Clean Water—I**  
**The Struggle for Clean Water—II**
- ☐ **The Oil Mystery** Harold Bernard  
**The Language of Odors**  
Dr. Stanley Freeman
- ☐ **The Muskegon County Experiment**  
Dr. W. Bauer & Dr. J. Sheaffer  
**The Sophisticated Dowser**  
Dr. Richard Parizek
- ☐ **The Lonely Atom** Dr. Philip Skell  
**How Green the Revolution**  
Lester Brown
- ☐ **Mercury: Another Look, Part I**  
Dr. John Wood  
**Mercury: Another Look, Part II**  
Dr. John Wood & D. G. Langley
- ☐ **The Troubles with Water**  
Dr. Daniel Okun  
**Pure Oxygen for Polluted Water**  
Dr. Jack McWhirter
- ☐ **Bubble Machines & Pollution Finders**  
Dr. K. Patel & Dr. L. Kreuzer  
**The Steam Engine: A Modern  
Approach** Dr. W. Doerner &  
Dr. M. Bechtold
- ☐ **Insects: The Elements of Change—  
Parts I & II** Dr. Carroll M. Williams
- ☐ **New Weapons Against Insects**  
Dr. G. Staal & Dr. J. Siddall  
**Moths, Drugs, & Pheromones**  
Dr. Wendell Roelofs
- ☐ **The Lead Issue**  
H. Mayrsohn & M. H. Hyman  
**Smog: An Environmental Dilemma**  
Dr. James Pitts
- ☐ **The Fusion Torch**  
Dr. B. Eastlund & Dr. W. Gough  
**The Impermanent Plastic**  
Dr. James Guillet

## SCIENCE

- ☐ **Science, Scientists, & the Public  
Interest—I**  
**Science, Scientists, & the Public  
Interest—II**

- ☐ **Nitrosamines: A Reappraisal**  
Dr. Phillip Issenberg  
**The Emperor of Ice Cream**  
Dr. Wendell Arbuckle
- ☐ **Ethics and Genetics**  
Dr. Robert F. Murray  
**The American Diet: A Critique**  
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Dr. William McElroy
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Redheads** An Essay Report  
**Vitamin D: A New Dimension**  
Dr. Hector DeLuca
- ☐ **Pica** Dr. J. Julian Chisolm, Jr.  
**Technology in the Nursery**  
Dr. William J. Dorson
- ☐ **Engineering Microbes**  
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Dr. David Ross  
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- ☐ **Lively Xenon** Dr. Neil Bartlett  
**The Repressor Hunt**  
Dr. Mark Ptashne
- ☐ **The New Prospectors**  
Dr. William Prinz  
**A Sober Look at Alcoholism**  
Dr. Jack Mendelsohn
- ☐ **Probing the Active Site**  
Dr. David Pressman  
**The Puzzle of Diversity**  
Dr. Oliver Smithies
- ☐ **Help for the Have Nots**  
Dr. Harrison Brown  
**The Closing Circle** Dr. Preston Cloud

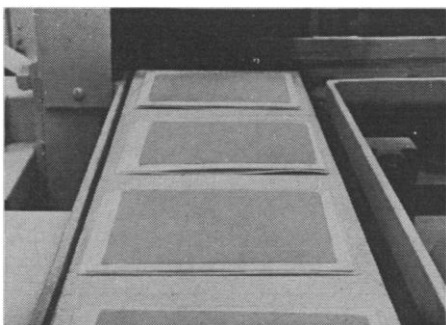
## OUTER SPACE

- ☐ **Molecules in Space**  
Dr. D. Buhl & Dr. L. Snyder  
**Chemistry Among the Stars**  
Dr. Bertram Donn
- ☐ **Molecules Meeting Molecules**  
Dr. John Richards  
**The Neutrinos of the Sun**  
Dr. Raymond Davis

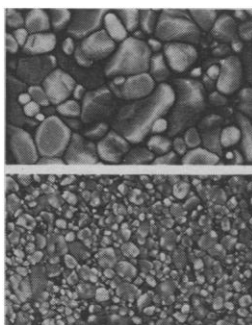
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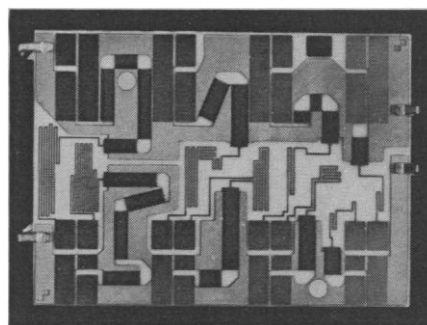
# WESTERN ELECTRIC REPORTS



**1500° C furnace** was specially designed to fire these new substrates. The relatively low temperature results in smooth substrate surfaces for practically fault-free thin film bonding.



**Electron micrographs** show the great difference in grain size between new ceramic material (lower) and the previous material (upper).



**Thin film integrated circuit** shown here is part of a resistor network. It is one of many that benefit from the improved substrate. Metal leads on sides are bonded by thermocompression to tantalum nitride resistor film.

## Smoothing the way for perfect thin film bonding.

Aluminum oxide, or alumina, is considered to have the best combination of properties for thin film circuit substrates. Until recently, however, the bonding of metal elements to gold-coated tantalum nitride resistor film on alumina was somewhat unpredictable.

Now, an advance at Western Electric has made it possible to get practically fault-free bonding of these materials.

This new perfection in bonding came through the development of finer grained alumina substrates.

The process has four basic steps: milling, casting, punching and firing.

During milling, alumina is combined with magnesium oxide, trichlorethylene, ethanol and a unique deflocculant. For 24 hours, this mixture is rotated in a ball mill. In a second 24-hour period, plasticizers and a binder are included.

The deflocculant plays a major role by dissipating the attraction forces that exist between the highly active alumina particles. This prevents thickening, which would ordinarily make an active alumina mixture unworkable.

The 48 hours of milling is followed by casting. When the material comes off the casting line, it is in the form of a flexible polymer/alumina tape, dry enough to be cut into easily handled sections.

After casting, a punch press cuts the material into the desired rectangles or

other shapes. Holes can be punched at the same time.

Finally, because of the use of active alumina, the material is fired at an unusually low temperature which results in smooth substrate surfaces for reliable thin film bonding. The finished substrate is then ready for the various processes of thin film circuit production.

In developing this new process, engineers at Western Electric's Engineering Research Center worked together with engineers at the Allentown plant.

**Conclusion:** This new way to produce substrates is a truly significant contribution for thin film circuit production.

The ultimate gain from this smoother substrate is for communications itself. For through the achievement of nearly perfect bonding of metal leads to tantalum nitride, thin films can be produced with even greater reliability and economy.



## Western Electric

**We make things that bring people closer.**



# AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

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## Rising Food Prices: Who's Responsible?

Twice in recent days, once in Hartford, Connecticut, and again in Los Angeles, I have watched television newsmen interview the women who organized the consumer protest and boycott over rising meat prices. In both cases the commentator asked the women who they thought was responsible for the price rise, whom their message was designed to reach. In both instances the women had difficulty with this question. They were not certain that the supermarkets were to blame, nor that it was entirely the farmer's fault, and they were not sure who was the middleman.

What they had never stopped to ask was whether they, as consumers and parents, might in any way be responsible for the soaring meat prices. As average American consumers, we have increased our per capita beef consumption from 55 pounds per year in 1940 to 117 pounds per year in 1972. Meanwhile, as parents, many of us have borne far more children than needed to replace ourselves, expanding our population by 57 percent during this same period. Altogether, our national beef consumption tripled, making us the leading world importer of beef.

During the 1960's, the world food problem was viewed primarily as a race between food and people. Now, in addition to continuing growth of the global population, we are witnessing the emergence of affluence as a major new claimant on world food resources.

The northern industrial countries—stretching from Ireland and the United Kingdom through Scandinavia, Western Europe, Eastern Europe, the Soviet Union, and Japan—now have income levels and dietary patterns that more or less correspond to those in the United States in 1940. In these countries, which contain two-thirds of a billion people, increases in purchasing power translate into rising consumption of livestock products, particularly beef.

We face constraints on the expansion of protein supplies in three important areas. Efforts to expand beef supplies are constrained by our inability to devise a satisfactory commercial technique for obtaining more than one calf per year per brood cow. For every animal that enters the production process, one adult animal must be fed and maintained for 1 year. Beyond this, it is difficult to substantially increase the carrying capacity of some of the world's principal grazing areas.

World fisheries are in deep trouble. From 1950 to 1968, the world fish catch expanded nearly 5 percent per year, which greatly increased the per capita supply of marine protein. Since 1968, however, the catch has been fluctuating rather unpredictably. Many marine biologists now feel that the global catch of table-grade fish is very close to the maximum sustainable level.

A third constraint is the inability to achieve a breakthrough in yields of soybeans, now a leading global source of high-quality protein. Since 1950, soybean yields in the United States have increased about 1 percent per year, in contrast to corn yield gains of about 4 percent per year. Being legumes, soybeans are not as responsive to the use of nitrogen fertilizer as are cereals. The fourfold increase in U.S. soybean output since 1950 has come largely from expanding the area planted. With 1 acre in every 7 of U.S. cropland now in soybeans, this expansion must eventually come to an end.

Short-term factors such as the disappearance of the anchoveta off the coast of Peru for several months and the crop shortfall in the Soviet Union may be obscuring a more fundamental transformation of the world food economy. Rapid growth in the global demand for high-quality protein and the above-mentioned constraints on expanding production may cause supply to lag behind demand. We may be witnessing the transformation of the world protein market from a buyer's to a seller's market, much as the world energy market has been transformed over the past 2 or 3 years.—LESTER R. BROWN, *Overseas Development Council*, 1717 Massachusetts Avenue, NW, Washington, D.C. 20036

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# Registration and Travel Information—Mexico City

## *Important Information about Travel Arrangements*

**This form goes to VIA CONVENTION PLANNERS, WASHINGTON, D. C.**

### HELP US PLAN MEXICO CITY

To AAAS Members:

AAAS has appointed VIA CONVENTION PLANNERS as the Official Agent for the inter-American meeting in Mexico City (June 20-July 4, 1973). Together, AAAS and VIA plan to offer members a special service whereby you or your organization will save up to 50% in air fare costs to Mexico City.

The basic idea of the service is to combine the transportation purchasing power of everyone traveling to the meeting in such a way as to SAVE YOU OR YOUR ORGANIZATION \$120 in flying to and from Mexico City.

Following is a list of BASIC Travel dates, on which you can save as a participating member of a group, and spend a day or two longer in Mexico City before and/or after the meetings. Also listed are HOLIDAY travel dates, which allow a total of 12 days in Mexico with some of the time spent in Acapulco after the meetings.

#### BASIC TRAVEL DATES

Depart	Return	Depart	Return
June 19	June 24	June 23	July 1
June 19	July 1	June 23	July 5
June 19	July 5	June 28	July 5

#### HOLIDAY TRAVEL DATES

Depart	Return	Depart	Return
June 19	June 30	June 23	July 7
June 19	July 7	June 28	July 11

Should you choose to depart on any of the above dates, you will need to return to your departure city on the corresponding date of return shown, in order to take advantage of the Group fares. You may, however, choose to travel on dates not shown above; we will be happy to arrange such travel and hotel accommodations for you at the regular Excursion or Economy air fares available. Your costs for hotel accommodations would be the same whether you travel with a group or as an individual.

Following are the Group air fares available. Excursion and Economy air fares will be given on request.

CITY	BASIC AIR FARES (roundtrip, Mexico City)	HOLIDAY AIR FARES (roundtrip, Mexico City with return from Acapulco)	CITY	BASIC AIR FARES (roundtrip, Mexico City)	HOLIDAY AIR FARES (roundtrip, Mexico City with return from Acapulco)
ATLANTA	\$149.48	\$163.48	KANSAS CITY	\$148.74	\$162.74
BANGOR	\$294.26	\$294.26	LOS ANGELES	\$153.74	\$167.74
BOSTON	\$215.74	\$215.74	LOUISVILLE	\$165.48	\$165.48
CEDAR RAPIDS	\$211.78	\$225.78	MIAMI	\$136.74	\$150.74
CHICAGO	\$164.74	\$178.74	NEW YORK	\$215.74	\$215.74
CINCINNATI	\$194.48	\$194.48	PHILADELPHIA	\$196.48	\$196.48
DALLAS	\$107.74	\$121.74	ST. LOUIS	\$149.48	\$163.48
DENVER	\$155.48	\$169.48	SAN FRANCISCO	\$180.48	\$180.48
DETROIT	\$194.48	\$194.48	SEATTLE	\$234.74	\$248.74
HOUSTON	\$ 79.74	\$ 93.74	TORONTO	\$195.74	\$195.74
INDIANAPOLIS	\$165.48	\$165.48	WASHINGTON, DC	\$195.74	\$195.74

**Important**—All of the above fares were quoted by the airlines involved and are subject to government approval and revision, however, we have extended every effort to quote the air fares which we believe will be in effect during the travel periods mentioned.

All of the above fares are based on a group of fifteen passengers traveling together, roundtrip, however, VIA is responsible to form the group wherever applicable and you may join as an individual participant.

#### BASIC PLAN FEATURES

For your convenience, we have reserved a number of rooms in the hotels listed below for the duration of the meeting (June 19-July 5) and a lesser number for the period ending July 12. Although these hotels are usually grouped into three main categories, Deluxe, First Class and Tourist, we have further sub-divided them into Moderate classifications. Moderate hotels are generally older or not as centrally located, however, many are favorites of persons who have visited Mexico City in the past and are highly recommended by travel experts.

DELUXE	MODERATE DELUXE	FIRST CLASS	MODERATE FIRST CLASS	TOURIST
Camino Real	María Isabel	Holiday Inn	Hotel Reforma	J. Amazonas
Fiesta Palace	Hotel Alameda	(Zona Rosa)	Hotel Bamer	Hotel Francis
Aristos		Emporio	Hotel Del Prado	Hotel Metropol
		Kings Palace	Gran Hotel De La	Versailles
		Casablanca	Ciudad De Mexico	
			Majestic	



# Official Advance Registration Form

This form goes to AAAS, Washington, for transmittal to CONACYT, Mexico City

## REGISTRATION

Name			
	Last	First	Middle
Address			
	Number	Street	Zip Code Telephone
	City	State	Country
Field or Professional Activity			
Undergraduate	Graduate Student	Baccalaureate	Ph.D.
Institution	Position		
Address			
	Number	Street	Zip Code Telephone
	City	State	Country
I will be accompanied by	Not Attending Scientific Meetings		

## REGISTRATION FEES \*

\$25.00 U.S. Currency = \$312.50 Mexican Currency (Pesos). Add \$5.00 to registration for accompanying husband or wife.  
Students with Identification \$2.00 U.S. Currency = \$25.00 Mexican Currency (Pesos) Receipt will be given on arrival.  
NOTE: Certified Check or Bank Draft must accompany this form and should be made payable to:

**Consejo Nacional de Ciencia y Tecnologia**

Signature

Please indicate below which sessions you expect to attend at the meeting.

### CENTRAL THEMES

The Sea and Its Resources	June 25, 26, 27 and 28	<input type="checkbox"/>	Hurricanes	June 22 and 23	<input type="checkbox"/>
Ecology and Deterioration of the Environment	June 27, 28 and 29	<input type="checkbox"/>	Symmetry	June 20 and 21	<input type="checkbox"/>
Deserts and Arid Lands	June 25, 26 and 27	<input type="checkbox"/>	Psychodysleptic Drugs, Addiction, and Pharmaceutical Education	June 28 and 29	<input type="checkbox"/>
Nutrition and New Food Technology	June 20, 21, 22 and 23	<input type="checkbox"/>	Research in Natural Products	June 25 and 26	<input type="checkbox"/>
Earthquakes and Earthquake Engineering	June 20, 21 and 22	<input type="checkbox"/>	Mathematical Questions in Biology	June 30	<input type="checkbox"/>
Science, Development, and Human Values	July 2 and 3	<input type="checkbox"/>	Educational Planning	June 29 and 30	<input type="checkbox"/>
Problems of Population	June 26, 27 and 28	<input type="checkbox"/>	Environmental Health in the Americas	July 3 and 4	<input type="checkbox"/>
Opportunities in Education	June 25, 26, 27, 28, 29 and 30	<input type="checkbox"/>	Health Services	July 2 and 3	<input type="checkbox"/>
Non-Nuclear Energy for Development	June 20, 21, 22 and 23	<input type="checkbox"/>	Health and Illness, Birth and Death: The Cultural Context for Bio-medical Intervention	June 29 and 30	<input type="checkbox"/>
Earth Sciences for Development	July 2 and 3	<input type="checkbox"/>	Neurohumoral Coding of Brain Function	June 26 and 27	<input type="checkbox"/>
			Aerobiology of Diseases, Pests, and Allergens in the Western Hemisphere	July 2 and 3	<input type="checkbox"/>

### TECHNICAL SYMPOSIA

Transfer of Technology and National Economic Development	June 20, 21, 22 and 23	<input type="checkbox"/>	Effects of Malnutrition on Human Development	June 25 and 26	<input type="checkbox"/>
Aerial Inventory of National Resources	June 21, 22 and 23	<input type="checkbox"/>	Development of Arid Lands	July 3 and 4	<input type="checkbox"/>
Tropical Ecosystems	June 29 and 30	<input type="checkbox"/>	Anthropology Applied to Health Programs	June 29 and 30	<input type="checkbox"/>
The Impact of Range Science in the Americas	June 30	<input type="checkbox"/>	Family Planning	June 29 and 30	<input type="checkbox"/>
Volcanism in Mexico and Central America	June 21, 22 and 23	<input type="checkbox"/>	Violence and Behavior	July 3 and 4	<input type="checkbox"/>
Geodynamics	June 20, 21, 22 and 23	<input type="checkbox"/>	Aquaculture in the Americas	July 2	<input type="checkbox"/>
Archaeo-Astronomy in Pre-Columbian America	June 20, 21, and 22	<input type="checkbox"/>	Wildlife and Its Environments in the Americas	June 25	<input type="checkbox"/>
Land Connections between North and South America	July 3 and 4	<input type="checkbox"/>	Interstellar Matter	July 4	<input type="checkbox"/>
			Sociolinguistics and Language Planning	June 27 and 28	<input type="checkbox"/>
			Information Requirements in Technology Transfer	June 25	<input type="checkbox"/>
			Human Dwellings	July 2 and 3	<input type="checkbox"/>

\* Mail this official form and your registration fee to:

MEXICO MEETING OFFICE  
AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE  
1515 MASSACHUSETTS AVENUE, N.W., WASHINGTON, D. C. 20005

CATEGORY	TWIN ROOM, DAILY (per person)*	SINGLE ROOM, DAILY
Deluxe & Moderate Deluxe	\$17.50	\$29.30
First Class & Moderate First Class	\$ 9.20	\$17.30
Tourist	\$ 8.20	\$12.20

\* Triple rates on request

Features included in the BASIC PLAN (IT2AMYCT01)

- Roundtrip air transportation between the city of your choice and MEXICO CITY on the airfares shown for that city
- Hotel accommodations at the hotel of your choice at the rate shown
- Roundtrip transfers between airport and hotel in Mexico City and handling of two pieces of luggage per person
- Scheduled transfers (unlimited) between your hotel and the site of the meetings, CENTRO MEDICO and return
- Services of a travel escort for the duration of your visit
- Hospitality desk service at your hotel for the duration of your visit (for information about local events and facilities)
- Consultant services at the Centro Medico
- Reception at hotel for members during your stay
- List of participating persons from your departure city
- List of speakers for the Central Theme and/or Technical Symposium you will be attending (per your information on the accompanying reservation form)

### HOLIDAY PLAN FEATURES

The HOLIDAY PLAN hotels in Mexico are the same used in the BASIC PLAN, listed previously. The hotels in ACAPULCO are as follows:

DELUXE	FIRST CLASS	TOURIST
Holiday Inn	Hotel Maris	De Gante
Paraiso Marriott		El Cid
Elcano		
Condesa Del Mar		

Rates for the HOLIDAY PLAN differ according to the time spent in Mexico City and Acapulco, respectively. Generally speaking, Acapulco hotels are more expensive than hotels in Mexico City and longer periods in Acapulco will raise your costs.

#### DATE

Arrive Mexico City June 19	
Depart Mexico City June 24	(overnight in Taxco)
Depart Acapulco June 30	
Deluxe: Twin room, per person	\$270.15
Single accommodations	\$374.93
First Class: Twin room, per person	\$185.86
Single accommodations	\$255.88
Tourist: Twin room, per person	\$163.59
Single accommodations	\$185.95

Arrive Mexico City June 19	
Depart Mexico City July 1	(overnight in Taxco)
Depart Acapulco July 7	
Deluxe: Twin room, per person	\$397.70
Single accommodations	\$579.96
First Class: Twin room, per person	\$250.26
Single accommodations	\$376.98
Tourist: Twin room, per person	\$221.04
Single accommodations	\$296.76

#### DATE

Arrive Mexico City June 23	
Depart Mexico City July 1	(overnight in Taxco)
Depart Acapulco July 7	
Deluxe: Twin room, per person	\$322.70
Single accommodations	\$462.80
First Class: Twin room, per person	\$213.46
Single accommodations	\$307.78
Tourist: Twin room, per person	\$188.24
Single accommodations	\$247.96

Arrive Mexico City June 28	
Depart Mexico City July 5	(overnight in Taxco)
Depart Acapulco July 11	
Deluxe: Twin room, per person	\$305.20
Single accommodations	\$433.51
First Class: Twin room, per person	\$204.26
Single accommodations	\$290.48
Tourist: Twin room, per person	\$180.04
Single accommodations	\$235.76

Features included in the HOLIDAY PLAN (IT2AMYCT01—M)

- All features in Mexico City as outlined in BASIC PLAN, plus
- Roundtrip air transportation from the city of your choice to Mexico City and return from Acapulco
- Deluxe Motorcoach transportation between Mexico City and Taxco (overnight in Taxco) and between Taxco and Acapulco
- Transfer between hotel in Acapulco and airport for your return flight
- Hotel accommodations of your choice in Mexico City and Acapulco in one of the hotels listed in each city and overnight accommodations in Taxco at a similar hotel
- Three meals in Taxco and breakfast and lunch or dinner in Acapulco for the duration of your stay in that city
- Reception at hotel in Acapulco during your stay

Not included in either Basic or Holiday Plan are items of a personal nature, i.e., telephone and cable charges, room services, valet service, gratuities to hotel personnel and any other item not mentioned in the included features of each plan.

For returning this form to VIA immediately we will guarantee you first option on air transportation and hotel accommodations. All reservations will be confirmed on a first-come, first-served basis.

Please consult elsewhere in this issue for information on Central Themes and Technical Symposia before completing the attached form.

Name \_\_\_\_\_

Address \_\_\_\_\_

Home Phone \_\_\_\_\_ Office Phone \_\_\_\_\_

Departure City \_\_\_\_\_

I would like to leave on \_\_\_\_\_ Date \_\_\_\_\_ and return on \_\_\_\_\_ Date \_\_\_\_\_

BASIC PLAN \_\_\_\_\_ HOLIDAY PLAN \_\_\_\_\_ OTHER \_\_\_\_\_

I will be attending the \_\_\_\_\_ Central Theme(s)

and/or the \_\_\_\_\_ Technical Symposium(s)

MEXICO CITY HOTEL

ACAPULCO HOTEL

(1st) \_\_\_\_\_ (1st) \_\_\_\_\_

(2nd) \_\_\_\_\_ (2nd) \_\_\_\_\_

(3rd) \_\_\_\_\_ (3rd) \_\_\_\_\_

Every effort will be made to accommodate you in your first choice hotel, depending upon availability at the time we receive your reservation.

I will require \_\_\_\_\_ Twin room(s)  
\_\_\_\_\_ Single room(s)  
\_\_\_\_\_ Triple room(s)  
\_\_\_\_\_ Other (special suites or meeting rooms for your group)

Total number of people in your party \_\_\_\_\_

Names \_\_\_\_\_

I am enclosing \$ \_\_\_\_\_ as a deposit to reserve the above arrangements.

A deposit of \$100.00 per person is required to reserve space. Upon receipt of your deposit VIA will forward you confirmation of your arrangements and an invoice for the balance due.

NOTE: All rates given are based on current tariffs and are subject to revision. Rates do not include personal items such as telegrams, telephone calls, valet service, room service, gratuities or any other item not mentioned in the Basic Plan Features.

This program is offered to AAAS members and members of affiliate societies in cooperation with and with the approval of Excursiones y Viajes, S.A., Mexico, D.F.

If you are not a AAAS member and would like to join please check this box ☐

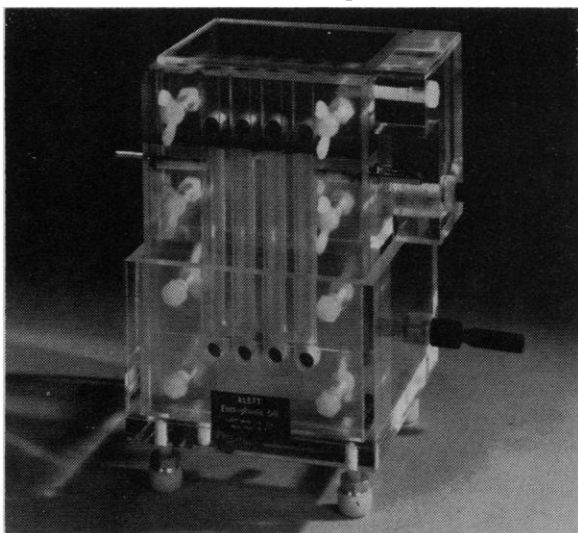
\_\_\_\_\_  
(Signature of member)

PLEASE CLIP AND RETURN THIS FORM TO:

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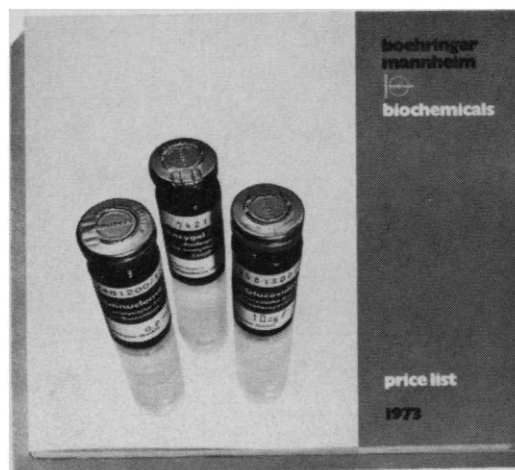
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40-60Ci/mmole \$84/250 $\mu$ Ci \$245/1mCi  
Benzene:ethanol solution, 9:1, sealed ampoule under  
vacuum.

**D-Aldosterone [4-<sup>14</sup>C] NEC-475**  
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**NEN** New England Nuclear

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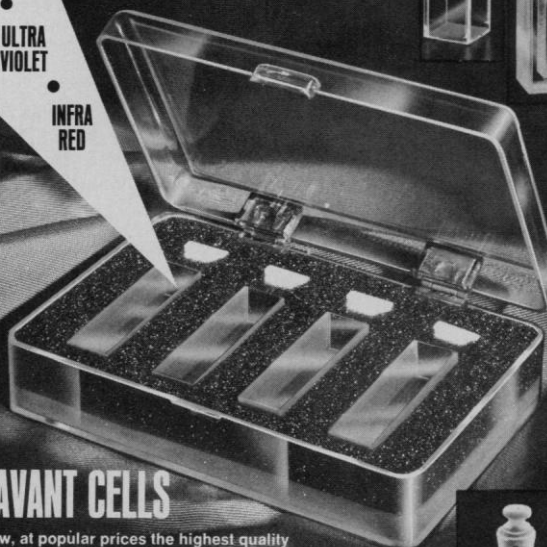
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(Continued from page 397)

## RECENT DEATHS

**Raphael O. Bachmann**, 51; dean, School of Pharmacy, West Virginia University; 18 December.

**Andrei Belozersky**, 67; biochemist and vice president, U.S.S.R. Academy of Sciences; 31 December.

**Horace M. Bond**, 68; former president, Lincoln University, and retired head, Bureau of Education and Social Research, Atlanta University; 22 December.

**Hugh B. Donahoe**, 50; associate chairman, chemistry department, St. Louis University; 11 December.

**Denise Dooley**, 81; professor emeritus of chemistry, College of Notre Dame of Maryland, 23 December.

**Irvine C. Gardner**, 83; former division chief, National Bureau of Standards, U.S. Department of Commerce; 29 December.

**Samuel Koenig**, 73; former chairman of sociology and anthropology, Brooklyn College, City University of New York; 29 December.

**Gordon C. Lee**, 56; dean, College of Education, Texas Tech University; 26 November.

**Albert C. Lichty**, 81; former professor of mechanical engineering, Yale University; 13 December.

**Maxwell I. Littman**, 58; associate professor of microbiology, Mount Sinai School of Medicine; 25 December.

**Cecil C. Lynch**, 68; professor emeritus of chemistry, University of Delaware; 27 December.

**Nathan L. Michener**, 74; former professor of pharmaceutical chemistry, Butler University; 22 December.

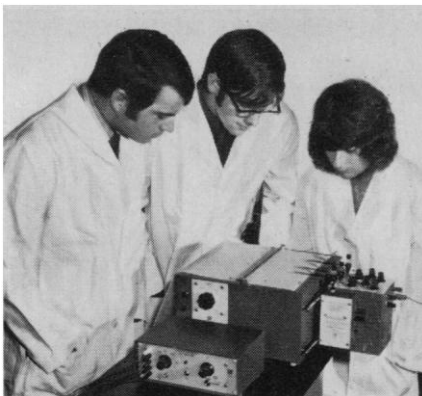
**James I. Moore**, 64; associate professor of ophthalmology, Johns Hopkins University; 16 December.

**Elizabeth K. Moyer**, 60; associate professor of medicine, Boston University; 28 December.

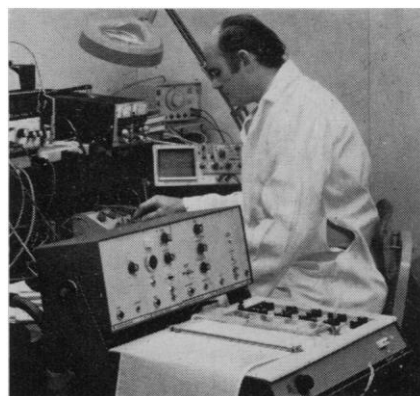
**William B. Parsons**, 84; retired professor of clinical surgery, College of Physicians and Surgeons, Columbia University; 2 January.

**Mindel C. Sheps**, 59; professor of biostatistics, School of Public Health, University of North Carolina, Chapel Hill; 15 January.

**Lancelot L. Whyte**, 76; physicist, philosopher, and former resident lecturer, Wesleyan University; 14 September.



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