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- *R&D Outlook in the Scientific and Engineering Community* • Impacts of new R&D budgets and policies on engineering; physical, social, and biomedical sciences; science and engineering education • Short- and long-range outlook for health of U.S. science and technology.

Research and Development: AAAS Report VI, by Willis H. Shapley, Albert H. Teich, and Gail J. Breslow, will be provided in advance to colloquium registrants. The Report covers R&D in the federal budget for FY 1982, a review of the federal budget process as it relates to R&D, and other topics on R&D and public policy. Registrants will also receive the published proceedings of the conference.

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LETTERS

Depression Study

We were generally pleased with Gina Bari Kolata's description of the Psychotherapy of Depression Collaborative Research Program at the National Institute of Mental Health (NIMH), (Research News, 24 Apr., p. 432). There were, however, some omissions and misidentifications: the directors of training in cognitive behavioral therapy, interpersonal psychotherapy, and pharmacotherapy are, respectively, Brian Shaw, University of Western Ontario (A. T. Beck and his staff conducted the initial 2-week training institute); Myrna Weissman, Yale School of Medicine; and Jan Fawcett, Rush Presbyterian-St. Luke's Medical Center.

The principal investigators at the three research sites are Stanley Imber, University of Pittsburgh; Stuart Sotsky, George Washington University; and John Watkins, University of Oklahoma. In addition to us, other NIMH staff centrally involved in planning this program include Suzanne W. Hadley and Joseph H. Autry.

IRENE ELKIN WASKOW

*Psychotherapy of Depression
Collaborative Research Program,
National Institute of Mental Health,
Rockville, Maryland 20857*

MORRIS P. PARLOFF

*Psychotherapy Research Branch,
National Institute of Mental Health*

Kolata's article on the clinical trial of psychotherapies, currently conducted by NIMH, seems accurate enough. However the trial itself warrants some comment.

In the first place, a problem arises because the condition being treated is identified simply as depression. There are many varieties of depression. One of the commonest is the simple anguished response to an unpleasant reality, and another is true melancholic illness. These are two syndromes that differ in many ways, but especially in the patient's resilience. Faced with a significant improvement of the noxious reality, the patient with depression of the first kind improves promptly, but the melancholic patient does not respond at all. Moreover there are mixtures, in which the two varieties are combined in various proportions.

Psychotherapeutic intervention often succeeds with the first kind, because the entry of the therapist into the patient's world changes his reality, and it is more effective if the therapist can actually help

the patient to change the reality, or to change his perception of it.

In the case of melancholic depression, psychotherapy is a most inefficient tool. Drug therapy works far more efficiently and sooner. Electric shock therapy too, though it currently enjoys bad repute, can sometimes literally save lives.

Even when melancholia is treated with medication, psychotherapy plays an important role. . . . But psychotherapy for melancholia becomes most valuable after the drug therapy has begun to take effect.

The NIMH project, as described, fails to distinguish among the varieties of depression, the differing functions of psychotherapy in each of these varieties, and at the several stages in the treatment and recovery process. The conception of the project reflects the view of the institutional psychiatrist who deals with patients in statistically significant numbers, with correspondingly insignificant personal attention to individuals. This contrasts with the understanding of the private practitioner who, intensively and laboriously, and using all the tools available, helps the individual patient escape from illness.

MORTIMER OSTOW

*5021 Iselin Avenue,
Riverdale, New York 10471*

. . . The topic of psychotherapy, as Freud discovered, evokes strong emotional reactions. Two extreme positions may be discerned: Therapists are either expected to produce "cures" of severe and long-standing disorders in a few sessions or the changes they are able to achieve with more promising cases are brushed aside as trivial. There is little purpose in assigning blame for the prevailing confusion, but it is clear that we need more adequate specification of what psychotherapy under particular circumstances can do and what it cannot do. Thus, any efforts to shed light on these issues are most welcome. For this fundamental reason, I strongly support the NIMH collaborative depression study. Moreover, the scientific community as well as the public can feel gratified that this ambitious project is being directed by a group of exceptionally well-qualified scientists. . . .

The reader should not conclude that we know next to nothing about psychotherapy, its *modus operandi*, or its benefits. Over the last 30 years there has emerged a large research literature whose sophistication has shown steady increments. In these developments, NIMH again has played a significant role by insisting on increasingly rigorous

standards of design and methodology. Broadly speaking, there is no doubt that psychotherapy contributes to the amelioration of a wide range of problems in human living. . . .

Psychotherapy is best viewed as an interpersonal process designed to correct maladaptive learning acquired in earlier human relationships with significant others. Depending on their life experiences and other factors, people, of course, differ widely in their ability to profit from what psychotherapy as an interpersonal learning experience has to offer. Furthermore, there are undoubtedly many ways in which people can make corrections in what they have previously learned. The skill of the therapist clearly plays an important part in the kind of learning experience that is mediated. . . .

Above all, there is a great urgency to demystify psychotherapy and to approach it realistically and soberly. It has already become apparent that psychotherapy is neither a panacea nor a worthless endeavor. It is also essential to clarify the *value* society is willing to place on the achievement of particular goals: To help a person cope more quickly and less painfully with an episode of depression may be a very different task from correcting long-standing patterns of disturbed interpersonal relations that recurrently give rise to depression. To all of these issues, systematic research can make significant contributions. . . .

HANS H. STRUPP

Department of Psychology, Vanderbilt University, Nashville, Tennessee 37240

. . . . Kolata quotes Strupp as saying, "But in psychotherapy [as opposed to injecting penicillin], the interactions between the patient and the therapist are crucial and the skill of the therapist is tremendously important." Remove the word "but" and there remains a truism that has nothing to do with evaluating psychotherapy.

The skill (or lack thereof) of a therapist attempting a particular type of treatment is simply a fact of that treatment. (Psychotherapeutic treatment does not exist independent of psychotherapists.) And if treatment works only for some patient-therapist pairs (due to the "interaction"), then that is a fact of treatment as well. Rather than obscuring the overall effect of treatment, these facts are part of it. Moreover, their effects as well can be studied at some future time (assuming positive results to begin with, and funding).

If, as appears reasonable, there are patient-therapist interaction effects and

therapist skills effects, the result will be that treatment will work for some patients and not for others. If treatment is efficacious in general there will still be an effect across all patients—just as if salt is poured in one container of water and its contents are mixed with another containing pure water, the resulting solution will still be saline. Of course, "cancelling out" could result if as many therapists are positively pernicious for particular patients as others are therapeutic. If so, third-party payments should be withdrawn, and patients should be liberated from the resulting lottery.

ROBYN M. DAWES

Center for Advanced Study in the Behavioral Sciences, Stanford, California 94305, and Department of Psychology, University of Oregon, Eugene 97403

Multiple Authorship

There is another way of handling the ethics of ownership of scientific publication based upon what we know about papers and citations. Basically it would appear that the productivity of scientists has been rather constant for the last few centuries. We publish about one paper per person per year because we tend to measure out our scientific lives in coffee spoons of an academic year at a time. Some variation exists because there are fields where a week or so of work corresponds to an atomic unit of publication, a separable entity valid as a research front contribution. Some parts of biochemistry have tiny atoms of knowledge like this, whereas some parts of astrophysics for example, correspond to 2 or 3 years of work and have therefore rather large atoms of knowledge. Such variations are easily corrected for by proper citation counts.

The recent movement does not seem to be any large increase in tendency to split large papers into small ones. We have always published the smallest separable units. The big thing that has happened is the move to multiple authorship. It began with the coming of massive government funding in the late 1940's. The major effect of a grant is that it enables the principal investigator to buy collaborators, and as an almost fiscal artifact of the funding, those collaborators must have their names on the resulting papers from the project. Although the overall average is still one paper per author per year, we have an average of two authors on each paper, and therefore each author is credited with two papers per year. The average

number of authors per paper is directly proportional to grant size.

The moral of this story seems rather clear. The payoff in brownie points of publications or citations must be divided among all the authors listed on the by-line, and in the absence of evidence to the contrary it must be divided equally among them. Thus each author of a three-author paper gets credit for one-third of a publication and one-third of the ensuing citations. If this is strictly enforced it can act perhaps as a deterrent to the otherwise pernicious practice of coining false brownie points by awarding each author full credit for the whole thing. We really ought to recognize as an ethical matter that each author in return for sharing the support also shares responsibility and credit. Those not sharing the work, support, and responsibility do not deserve their names on the paper, even if they are the great Lord Director of the Laboratory or a titular signatory on the project. Any time you take a collaborator you must give up a share of the outcome, and you diminish your own share. That is as it should be; to do otherwise is a very cheap way of increasing apparent productivity. The graduate students who are one of 20 on the by-line of a paper coming out of the big machine have just won one-twentieth of a paper each for their bibliographies. There is, it must be noted, some actual increase in production, for there are many more people capable of producing half a paper than those who could make a whole paper.

DEREK DE S. PRICE

History of Science, Yale University, New Haven, Connecticut 06520

Gossypol: Effect on Testosterone

Thomas H. Maugh II (Research News, 17 Apr., p. 314) describes gossypol as a male "pill" that acts by blocking the enzyme lactate dehydrogenase X. This is clearly interesting, but I believe it is premature to conclude that gossypol "does not affect . . . sex hormone levels. . . ." We have demonstrated a marked reduction in testosterone secretion by Leydig cells obtained from gossypol-fed rats (1).

MARTIN DYM

Department of Anatomy, Harvard Medical School, Boston, Massachusetts 02115

References

1. M. A. Hadley, Y. C. Lin, M. Dym, *J. Androl.*, in press.