

technique, with focus on effects in patients with glomerulonephritis, rheumatoid arthritis and renal transplantation. More recently, myasthenia gravis and systemic lupus erythematosus have also come under investigation. The UCLA Interdepartmental Clinical Case Conference presented elsewhere in this issue summarizes several years of experience in that institution with prolonged thoracic-duct drainage in a number of patients with rheumatoid arthritis and in two patients with systemic lupus erythematosus.

The UCLA experience is superior to others previously published; the investigators in that institution achieved a technical proficiency that allowed them to keep thoracic-duct drainage going over many weeks, each day returning the humoral elements of the lymph to the patient by intravenous infusion. Changes in immunologic function and manifestations of disease could, therefore, reasonably be attributed to the lymphoid cell loss in the patients. This study presents us with the most nearly definitive data yet developed that rheumatoid arthritis is an immunological disease. The study does not tell us, however, the relative importance of T cells or B cells in the process.

One of the terrible burdens borne by clinical investigators is the difficulty of developing adequate controls for their observations of patients. Sometimes, as in this study of thoracic-duct drainage, truly adequate controls can never be developed. Consequently, although the reported improvement of patients with rheumatoid arthritis in all reported studies of thoracic-duct drainage is very impressive, all those who know rheumatoid arthritis know the importance of suggestion as a placebo effect and of hospital admission alone as a therapeutic effect in the disease. Dr. Paulus and his colleagues are well aware of these effects and have done their best to cope with them. The difficulty is well illustrated by their need to resort in one phase of their report to the clinical course shown by their patients during previous hospital stays, for entirely different purposes, as the control for the same patients now in hospital for thoracic-duct drainage. Nor is the presentation of the clinical course of a patient who did not have a successful thoracic-duct drainage a truly adequate control for those who did have the drainage successfully instituted. But we are men, not mice, so a true sham-operated control, double-blinded for evaluation, is obviously impossible, and again the UCLA group have done the best that they could.

The casual observer might be most impressed

by the reported exacerbation of clinical manifestations of disease after reinfusion, intravenously or intraarticularly, of live thoracic-duct lymphocytes into patients, whereas injected dead cells did not cause exacerbation. One major technical deficiency in these observations is that a further control is needed beyond that of the dead cells. It should have been shown that live cells from a haplotype-identical normal donor (a first-degree relative would have a reasonable likelihood of providing such cells) also did not cause appearance of clinical symptoms. There is also a theoretical problem: We need to understand why the cells from a single day's thoracic-duct drainage given intravenously to patients generally exacerbated their symptoms promptly, while clinical manifestations of disease generally did not reassert themselves until weeks after discontinuation of thoracic-duct drainage. It seems unlikely that it takes several weeks for the thoracic duct to begin to deliver its full complement of lymphoid cells to the blood again; but, if this is so, these investigators have failed to demonstrate that to us.

Despite these difficulties, the UCLA experience is impressive and important. The most striking and convincing findings were of the degree of immunodeficiency induced in their patients, most vividly displayed in the induction of prolonged tolerance to skin grafting. If, in fact, prolonged thoracic-duct drainage can be developed to the point at which it can with reasonable frequency allow the induction of immunological tolerance in man, a wide range of new therapeutic possibilities could be opened up.

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Can GIGO Be Eliminated?

ONE OF THE most pressing unsolved problems in today's society is how to deal with the great social, economic and political complexity that is the product of scientific and technologic progress. The problems related to this complexity are worldwide, but are particularly troublesome in the more advanced industrial nations, and even more so in so complex an enterprise as health care in this nation. The problems are probably the most obvious in America where they are certainly evident in medicine and health care. There are two easily

discernible efforts to deal with this complexity; both in a way strike at the heart of the American system and our way of life.

A basic difficulty seems to be that as our science progresses and the new knowledge is applied in an increasingly interdependent technologic society, the number of bits and pieces that have to be dealt with, and the ways they must relate to one another if things are to run smoothly, increases exponentially. The response of science and technology to this has been to develop computers which can process bits (or bytes) of data with astonishing speed and absolute accuracy. But computers can do only what they are programmed to do—no more, no less. In computer parlance *GIGO* means “garbage in, garbage out,” which is to say that a computer has no way of addressing a problem except in the fashion it has been programmed. Computers are useful, even essential, in modern society, but they are insensitive and inanimate, and to the extent they touch people’s lives, as with computerized personal financial or health data for example, they know not what they are doing.

Government in all its branches, and particularly the federal government, has been overwhelmed by all these new technologic, social, economic and political bits and pieces, and the ways they must relate to one another. In our system we elect our lawmakers and other officials, expecting them to see that things run smoothly with as little interference in our daily lives as possible. But the time has long since passed when the constitutionally appointed officers can do all this themselves. The time is simply not available. There is more to be done than any one person can do. Their answer has been to proliferate large and, in the case of the Congress, sometimes huge staffs of professional and clerical assistants (paid by the taxpayers) whose function is really to do the work for the duly elected or appointed officials, who in turn must necessarily be guided by the advice of their assistants when they speak or act. Many of these advisors are bright, energetic and ambitious young persons fresh from college or professional school. Others are professional government bureaucrats. In both cases the advisors usually have little or no firsthand knowledge or experience with the problems to be dealt with. Thus it turns out that more and more of our constitutionally chosen government officials are being programmed by staff who for these reasons may be relatively insensitive to the nature of real problems as they

actually exist or to the significant human factors involved which are inherent in them. Certainly we are seeing more and more *GIGO* in the activities of all branches of our government.

It is unlikely that *GIGO* can ever be completely eliminated, but if something could be done to increase the sensitivity and the real knowledge (as distinct from conceptual or theoretical knowledge) of the programmers, whether of computers or of government, *GIGO* might be at least lessened. In the health care field this might be more likely to happen if knowledgeable physicians and other health professionals, as well as knowledgeable members of the public, were more often involved in both the planning and the decision-making process. The programs in the health field, as a result, would much more likely be more responsive to real needs and be more workable. Consensus rather than control would become more the order of the day. And this would tend to enhance rather than erode the American system and way of life.

—MSMW

Happiness Hormone?

EVERY PHYSICIAN knows that some of his patients accept pain without a whimper, while others will cry out at a pin prick. For the removal of a wart one person will need only a few drops of procaine hydrochloride (Novocain), others will need a syringeful. Some obstetrical patients will allow us to make an episiotomy incision and its repair with little or no anesthesia, while others will tense up at the touch of a finger.

We have usually passed this off by saying “It’s all in their head.” But now Dr. Choh Hao Li, Director of the Hormone Research Laboratory of the University of California in San Francisco, has given us reason to believe that this off-hand remark may come very close to being scientifically correct. He has shown that the pituitary gland, that tiny dynamo that sits there in the sella turcica, unnoticed and unappreciated by most of us, produces varying quantities of a powerful pain-relieving and pain-preventing hormone. He has named the substance beta-endorphin.

If this taxes our credulity, seeming just a bit too good to be true, let us be reminded that C. H. Li and his co-workers discovered adrenocorticotro-