29–30 December

## Sentics, Brain Function, and Sources of Human Values

This symposium is a continuation of a symposium held last year, "Biocybernetics of the Dynamic Communication of Emotions and Qualities." Sentics is the science of auto- and cross-communication of emotion in the present moment through natural biologic spatio-temporal forms—as distinguished from conventional signs—that are called essentic forms.

This mode of communication acts in symbiotic, biologic design cooperation between two neurophysiologic data processing codes—the expression and the recognition of precise spatio-temporal entities. The inflections of smiles, tone of voice, gesture, dance steps, and so on, are subject to a precision both in their generation and recognition. This symposium studies the origin and function of this precision.

It appears that for each emotion, of the spectrum of emotions, there exists a brain algorithm that determines a spatio-temporal form (or essentic form) common to the expression of that emotion, regardless of the particular output modality chosen. It has therefore been possible to standardize the measurement of essentic form by using the expression of transient pressure of the finger, measured in two dimensions. Differential equations describing these forms were found, and cross-cultural and other measures were obtained that indicate their biological origin.

Communication in the present moment is more powerful the more closely the essentic form approaches the "pure" form for that emotion. (Gain of the communication channel is a form function.) Studies are reported on the auto-communication functions of expression, as well as of cross-communication.

Repeated production of essentic forms in this manner at appropriate, nonrhythmic time intervals shows that they are auto-generative—an effective method for the generation of fantasy emotion states.

Sentic cycles are a self-generated series of fantasy emotion states, using the expression of essentic form and finger transient pressure, repeatedly initiated by appropriate random timing signals. A series of eight such fantasy states are produced in sequence (3 or 4 minutes for each state) in such a cycle —traversing, substantially, the spectrum of emotions in approximately half an hour—no emotion, anger, hate, grief, love, sex, joy, and reverence.

It was found that such emotion states can be experienced without specific situational content, as an idiolog (as also is evident in music).

The symposium will survey aspects of the theory of sentics, the role of idiologs in wakefulness and dreams, biologic foundations of essentic form, and the relation of purity and function of essentic form to qualities and the source of human values. New concepts extending last year's findings will be introduced. Psychometric investigation of sentic cycles will be presented, aspects of the relationship of physiologic effects of sentic cycles and meditation will be discussed (including cardiovascular, respiratory, metabolic effects), and also the use of sentic cycles in psychotherapy and psychosomatic therapy of individuals and groups.

Some cross-cultural, anthropologic and psychologic, and musical aspects of essentic form production and recognition will be examined.

The concluding sessions will concern the role of sentics in society, and examine possibilities of planning which may include the sentic basis of communication of human values.

MANFRED CLYNES
*Biocybernetics Laboratories Research Center, Rockland State Hospital, Orangeburg, New York*

29–30 December

## Regulation of Organ and Tissue Growth

The body as a whole is the sum of its parts. Each part is represented in proportion to how much it is needed. When functional demands increase, overworked organs enlarge. Disuse, on the other hand, leads to atrophy. The "normal" dimensions of our tissues and organs reflect a balance between the ever-present tendencies to grow and shrink, tendencies which account for the ceaseless turnover of bodily components and the renewal of tissues throughout life.

The importance of these mechanisms cannot be exaggerated, the more so for our profound ignorance of how physiological activity is translated into growth. In some cases there are humoral agents which seem to communicate insufficiencies to homologous tissues, thereby triggering compensatory reactions. In other cases, it is nerves which mediate adaptive growth responses. One way or another new proteins are elaborated as RNA synthesis and, in most cases, DNA synthesis, too, are turned on.

Charles P. Leblond (McGill University) will deliver the keynote address of the symposium, focusing on those aspects of growth and renewal that apply to organs and tissues in general. This will be followed by several papers on tissues which grow primarily by cellular hypertrophy. The growth of the brain will be particularly interesting, especially as it may be affected by fetal malnutrition brought on, for example, by intrauterine competition. Equally important is the problem of how skeletal muscle fibers respond both physiologically and morphologically to exercise, denervation, and severed tendons. The heart is another organ which lends itself to the exploration of factors responsible for muscle growth. The theoretical upper limit of heart size is an intriguing problem from which we might learn why some cells stop increasing in number but continue to grow in size at a preordained point in ontogeny.

Among the more proliferative tissues, skeletal elements are instructive in seeking explanations for how things grow. They, perhaps more than most tissues, are subject to both genetic and environmental influences. Where the one leaves off and the other begins can be profitably probed in studies of bone growth. Few tissues have yielded more valuable information than blood cells. The ease of sampling, coupled with the

constant turnover of these elements, has enabled investigators to explore in depth the factors by which their numbers are regulated in the circulation. Hence, the role of erythropoietin in red blood cell production is particularly instructive. No less important, though less well understood, is the control of platelet production by thrombopoietin, and how this relates to the regulation of the megakaryocyte population. Lymphocytes are especially noteworthy, if only because of their complex functions, uncertain origins, and well-known sensitivity to antigenic stimulation.

Many organs of the body do business with the environment by means of a duct system. The lung, for example, poses some special problems in its response to high and low oxygen tensions, its relation to disease, and the factors which regulate its normal growth in the postnatal mammal. Few organs of the body respond to as many growth stimuli, it seems, as do the salivary glands. How their growth is affected by rate of activity, innervation, diet, and other factors will be discussed. The exocrine pancreas exhibits a very unique feature—the nearly complete degeneration of its substance under the influence of ethionine, followed by its nearly complete regeneration when the drug is discontinued. Even the intestines, when partially removed, will adapt the function and structure of what remains to the needs of the body. The liver has been the organ of choice for those interested in growth control over the years, and although it has probably received more attention than any other organ, its secrets seem to be as elusive as ever.

Compensatory growth of the kidney has baffled investigators for many years and promises to do so for a long time to come. How its size is determined and how it reacts to injury will be an especially important contribution to this symposium. The mammary glands show how hormones can regulate the growth of an organ. Similarly, the testis is responsive to endocrine factors which regulate its function as well as its growth. Recent research has shown that the ovary is subject to control by the pineal gland, in addition to the usual gonadotrophic hormones.

The symposium will conclude with a paper on the placenta, an organ whose growth is controlled more by the ovaries than by the embryo it supports.

In the belief that basic principles can best be discovered by the comparative approach, this symposium has been designed to bring together a broad spectrum of interests representing many of the major organs and tissues of the body.

Hopefully, there might be basic principles underlying all kinds of growth, notwithstanding the fact that each and every organ develops in its own unique way. Yet they all share much in common. So it is that what is learned about how the growth of one organ is regulated may yield clues as to how other organs are controlled.

RICHARD J. GOSS
*Brown University,*
*Providence, Rhode Island*

**29 December**

## Looting the Past: An International Scandal

In recent years the wanton looting and illegal trafficking of antiquities, including significant national treasures, has reached unbelievable proportions throughout the world. The expanding markets (domestic and foreign) for these archeological objects, combined with lax enforcement, encourages the continued destruction of archeological sites and the scientific context from which the objects were derived.

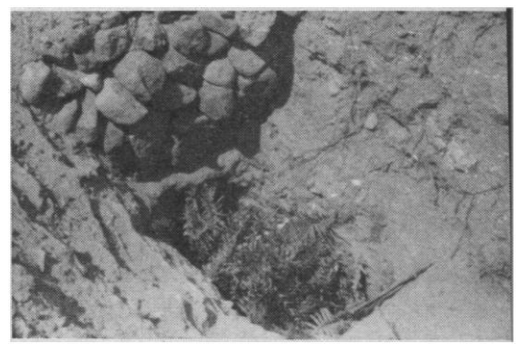
The situation is having serious consequences for professional archeologists and other scientists. Since the United States is one of the largest markets for these stolen goods, several foreign countries are openly threatening to ban professional foreign archeologists from excavating in their lands. This symposium will delineate the problem by focusing on certain countries and geographical areas where the problem is particularly acute.

Art objects of priceless value leave southeast Asian countries almost daily while similar objects from India, robbed by organized gangs from tombs, have later appeared in private collections in the United States. Some of the most publicized antiquities coming illegally from Anatolia have been displayed in leading museums here and abroad.

Throughout Latin America sites are destroyed, tombs are opened, and monuments defaced as looters supply the demands of Americans, often members of the diplomatic corps, and foreign nationals alike. It is such episodes that are jeopardizing scientific investigations and straining foreign relations.

Looting is so pervasive and so lucrative that in some areas, such as Costa Rica, it has become an important part of the local economy. At the other end of these affairs are the museums. Some are now refusing to buy or to accept antiquities that are not legitimately obtained. However, others continue to brighten space with tax deductible gifts, illegally derived.

UNESCO and many foreign countries are feverishly working, often under the greatest of handicaps, to cooperate with scientific archeologists and art historians in legitimate pursuits of knowledge of the past. But even the best intentions are strained when stolen national treasures are unveiled in a foreign land. Thus other measures, which will be discussed in this symposium, must be enacted immediately for the continuation of scientific investigations and for the lasting benefit of the peoples in foreign lands.



Looted cemetery.

RICHARD I. FORD
*University of Michigan,*
*Ann Arbor*

National Public Radio, the new public broadcasting network, will cover the 1971 Annual Meeting. For 4 days NPR will cover live a morning, an afternoon, and an evening session—each from a different symposium. NPR has 110 interconnected stations and will mail tape recordings for delayed broadcast to more than 200 other stations. Consult your local educational or university-operated radio station for program information.