which (excluding weeds and cultivars) boils down to some 128 mostly native mesophytes, of which the representatives in the two areas apparently are identical in 64 instances, intraspecifically different in 25, and classifiable as related but distinct species in 39. Hara emphasizes that the Himalayan plants are in general adapted to a milder climate than that of Japan, lacking the severe insular winters, and calls attention to the total absence in Eastern Himalaya of the characteristic Japanese temperate deciduous forest.

"Although Eastern Himalaya and Japan are now widely separated, the floras of both regions are considered to have been derived from the common flora of the Tertiary which had covered whole East Asia including Himalaya, China, and Japan." These environmental and geographical changes, which must have been most intensive during the period of Quaternary glaciation, caused the taxa to differentiate in somewhat different directions. "Thus, to compare critically various corresponding taxa which are now found in Eastern Himalaya and Japan gives important data on the origin of the Japanese flora and the evolution of the plant groups involved in the flora."

For those who have been interested in comparing the flora of Japan either with that of the eastern United States and Mexico or with that of the Pacific Coast of North America, this attractive book adds a whole new dimension.

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Tools for Taxonomists

Botanical Latin. History, Grammar, Syntax, Terminology, and Vocabulary. WILLIAM T. STEARN. Hafner, New York, 1966. 580 pp., illus. $16.75.

An English-Classical Dictionary for the Use of Taxonomists. ROBERT S. WOODS. Pomona College, Claremont, Calif., 1966. 345 pp. $5.50.

The International Code of Botanical Nomenclature decrees that, in order to be validly published, any name of a new taxon of plants (bacteria and fossils excepted) must be accompanied by a diagnosis or description in Latin or by a reference to a previously published description in the same language. In order to supply such validating diagnoses, botanists are therefore obliged either to acquire a sufficient knowledge of the grammar and vocabulary of Latin to do this themselves or to have recourse to outside scholarly help. Add to this the fact that Latin was the standard language for botanical texts from the time of Linnaeus up to about a century ago, and it becomes obvious that all taxonomic botanists should be equipped with a knowledge of the language. Stearn's book supplies a most valuable working tool to enable those who are not classical scholars to construct intelligible diagnoses and descriptions and to understand the fundamental information contained in earlier works. After a sketch of the historical development of botanical Latin terminology, the author proceeds to a condensed outline of the grammar and syntax and gives standard sample descriptions in Latin of representatives of various plant groups, from algae to angiosperms, with additional chapters on color terms, habitats, geographical names, general descriptive terminology, and so on. A comprehensive vocabulary, with both Latin and English equivalents alphabetically arranged, contains all the terms commonly used in botanical Latin, with exact definitions. The excellent line drawings included in the text facilitate exact understanding of many of the technical terms employed. Apart from its practical value, this remarkably erudite and carefully constructed treatise is entertainingly written and contains much interesting information on the evolution of the Latin language as a medium of botanical communication. It is only to be regretted that such an outstanding and faultless scholarly work should be marred by the incredible carelessness of the publishers in misspelling Stearn's name on the cover.

Woods's *English-Classical Dictionary* contains, with their literal Latin and Greek equivalents, all words occurring in lexicons of those languages which are or could be used in taxonomic nomenclature. Insofar as possible, ambiguous terms are avoided. The chief use of the book to botanists and zoologists will be as an aid in the selection and construction of suitable epithets for new taxa. Grammatical notes are restricted to a table of case terminations in Latin and Greek, with equivalents. Greek words are transliterated into Roman characters; it would have been useful to include also the Greek alphabet for the benefit of those totally unfamiliar with that language. The typography is good, with the key words in clear bold-face letters.

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Biological Self-Regulation

Living Control Systems. L. E. BAYLISS. Freeman, San Francisco, 1966. 199 pp., illus. $5.

This posthumous book by a noted physiologist attempts to present an introduction to the theory of control systems (more particularly, servomechanisms) with illustrative material drawn chiefly from muscular and physiological responses. The approach is chiefly qualitative, with a supplemental chapter on the elementary mathematics of servo systems at the end of the book. On the whole, the author is quite successful in introducing the reader to such concepts as proportional control, integral control, linear and nonlinear transfer functions, stability, and damping on an intuitive basis, assuming a minimum of mathematical sophistication. This will probably be a welcome opportunity for many students in biological sciences to learn something of this subject without having to tackle one of the more formidable engineering-oriented textbooks. Occasionally, however, the more sophisticated reader may find himself irked by the obvious circumvention of an equation or formal definition in an attempt to avoid mathematical statements, and since the author does assume some scientific background it may be that he has leaned too far in this direction.

The book is primarily a statement of general principles and should not be construed as a thorough review of the application of these principles in living systems. With the growing interest among biologists in such phenomena as genetic induction and inhibition, enzyme kinematics, and control functions of the central nervous system, it is perhaps unfortunate that there are not more examples from these fields, although the choice of such traditional examples as stretch reflexes, iris con-

trol, breathing, and blood pressure probably serves better for illustrating basic interactions.

For the reader to whom the title suggests a more general treatise on biological control systems, including such phenomena as learning and decision-making, and with a greater emphasis on the regulation of behavior, a word of clarification may be helpful. The term "control system," as lifted from its engineering heritage, implies a very different subject matter from that of a "decision function" or "information processing system." The mathematics of control systems has developed entirely around the regulation and stabilization of one or several "output variables" emanating from a system ubiquitously named the "plant." The plant may be anything from an airplane to an oil pipeline. This field of mathematics is now highly developed and systematized, and has been most influential in such presentations as Norbert Wiener's *Cybernetics* or Ross Ashby's *Design for a Brain.* It is only recently, through such hybrid concepts as discrete control systems, that decision theory, which comes from a totally different mathematical heritage concerned with choices among alternatives, has begun to interact with control theory, Bayliss' book adheres rather strictly to the former tradition. A comparable volume dealing with the theory of decisions and choices in biological systems still remains to be written.

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Mankind by Design

Genetics and the Future of Man. A discussion at the first Nobel Conference, St. Peter, Minnesota, January 1965. JOHN D. ROSLANSKY, Ed. Appleton-Century-Crofts, New York, 1966. 216 pp., illus. $5.

The first Nobel Conference, held at Gustavus Adolphus College, covered much the same ground as that of earlier meetings on the genetic prospects of man, notably the Ciba Foundation conference in London (*Man and His Future*, Gordon Wolstenholme, Ed. Churchill, London, 1963) and a conference in Indiana (*The Control of Human Heredity and Evolution*, T. M. Sonneborn, Ed. Macmillan, New York, 1965). The six essays are all excellent, but only two are remarkable enough to deserve extended comment at this time.

Writing on "Sociological aspects of genetic control," Kingsley Davis, professor of sociology at the University of California (Berkeley), gives a penetrating analysis of difficulties in the way of instituting eugenic programs. It is often asserted that effective eugenics must await a complete knowledge of human genetics, presumably down to the last nucleotide. This, says Davis, is a patent rationalization for inactivity embraced for other reasons. Immense progress was made in animal and plant breeding long before anything was known of genes—in prehistoric times, in fact. To change the genetic structure of any species one merely needs to understand selection and believe in heredity.

The allegation that we must have complete agreement on the end desired is also dismissed as a rationalization: we do not agree on anything, says Davis, but that does not prevent our acting in other matters. We pass laws governing birth control, tax exemption for religious institutions, restrictions on the sale of alcohol, and rules governing the adoption of children, though we are far from being in complete agreement in these matters:

> My view is that the main reason why human genetic control has never been seriously tried lies in the stability factors of the socio-cultural system. It does not lie in the slowness of genetic change, in the paucity of genetic knowledge, or in the lack of consensus. It lies rather in the stubborn resistance to change inherent in human societies. In other words, eugenics is itself a social movement. Before it can be effective genetically, it has to be effective socially. It has a double barrier to cross, because it combines in a peculiar way the two systems of transmission in the human species. The changes in society that would be required to succeed in a program of human genetic control would be so fundamental that they would tend to dwarf all previous social revolutions. The socially transmitted sentiments and behavior patterns that would have to be disturbed are so deep in the minds of all of us that any imagined escape from them seems either horrible, paradoxical, or ridiculous, because they turn into pure means the things that we conceive to be ultimates.

Following the path of other speculators, Davis envisages various possible worlds in which transsemination and transplantation of ova are utilized, and in which "parents would . . . regard [such a] child as their own—much as a purchased house or car becomes a source of pride to its new owners, regardless of the fact that they themselves did not manufacture it." The nuclear family might also virtually disappear and the raising of children be taken over by professional child-raisers. But, he adds, "the more one pursues such speculations the clearer it is that they are of little value. They do not, for example, enable us to predict the kind of social system required for genetic control."

Classical eugenics failed to order its problems in the proper sequence for action; hence the nearly total eclipse of eugenics in the 1930's. Today, eugenics survives (but just barely) as a topic for academic discussion perhaps largely because Frederick Osborn in 1940 conferred "denatured respectability" on the subject in his book *Preface to Eugenics.* This he did by paradoxically emphasizing the importance of improving the environment. Why this approach? Davis points out:

> In an era when the Nazis in Germany had made genetic control synonymous with racism in the eyes of most intellectuals, Osborn was apparently trying to deflect hostility by borrowing the ideology of "environmentalism" and conferring it illogically on eugenics. He reached the comforting conclusion that democracy, individualism, and freedom will automatically provide beneficial genetic control. He thus evaded the problem of authority and discipline altogether, but aligned eugenics on the side of liberal dogma, denaturing the movement in the process.

There the movement contentedly rests at present. Davis, keenly aware of the homeostatic powers of society available for the negation of all attempted change, does not assert that we will