chemicals on growth in protozoa at the agronomist, U. S. Military Government in Korea, vice-chairman. Branch societies, one each in Kyonggi Do and Kang Won Do provinces, were organized earlier and have been holding regular meetings.

The New York Academy of Medicine has recently organized a Section on Microbiology. The main objectives of this section will be the encouragement of the exchange of information among microbiologists and the promotion of ready contacts between clinical and laboratory investigators. The Fellowship of the section will be broad, including not only those who have a direct interest in microbiology, but also those who deal with microbiology in their primary functions as clinicians or scientists in other branches. The officers of the new section are: Gregory Shwartzman, Mount Sinai Hospital, chairman; Harry Most, New York University College of Medicine, secretary; and René J. Dubos, Rockefeller Institute for Medical Research, Frank L. Horsfall, Jr., Rockefeller Institute for Medical Research, Colin M. MacLeod, New York University College of Medicine, Ralph S. Muckenfuss, Research Laboratories, New York City Health Department, and John G. Kidd, Cornell Medical College, advisory committee.

Chicago Natural History Museum has acquired a large and important collection of plants from Ecuador, assembled and presented by M. Acosta Solis of that country. According to Julian A. Steyermark, assistant curator of the herbarium, this is the largest collection from Ecuador so far received by any institution. It is also one of the largest from a South American country to have reached the Museum.

Make Plans for—

Fifth International Pediatrics Congress, July 14–17, Waldorf-Astoria Hotel, New York City.

Symposium on Sound, July 21–22, University of Utah, Salt Lake City.

Conference on Algebra, July 25–28, University of Michigan, Ann Arbor.

American Association for the Advancement of Science, 114th Meeting, December 26–31, Chicago, Illinois.

COMMENTS *by Readers*

Perhaps no words are more often used incorrectly by systematists and their colleagues than *availability* and *validity*. The words are often erroneously used interchangeably and even with still a third meaning. Actually, three clear-cut concepts are involved: (1) simple proposals of names, whether in compliance with "legal" requirements or not; (2) "legally" acceptable proposals; and (3) "legally" acceptable proposals which can be recognized. An understanding of these concepts and the proper expression for each would greatly simplify and clarify nomenclatural discussions. The frequency with which they are inadequately distinguished has led to almost endless confusion.

For example, all of the following are occupied: *Scincus americanus* Petiver 1711, *Henicognathus annulata cyclura* Cope 1886, *Coluber novae Hispaniae* Gmelin 1788, *Bascanium semilineatum* Cope 1891, *Coluber arizonae* Boulenger 1894, and *Salvadora grahamiae* Baird and Girard 1853. All have been published in journals or books generally available to the public. Accordingly, *any name, once published, is occupied;* it may be available and/or valid or not.

However, *Scincus americanus* Petiver 1711, *Henicognathus annulata cyclura* Cope 1886, and *Coluber novae Hispaniae* Gmelin 1788 are not available (and therefore cannot be valid), since each violates at least one requirement of the International Rules of Zoological Nomenclature. The first name is pre-Linnaean (acceptable names must have been proposed after January 1, 1758); the second is a *nomen nudum* (no diagnosis or definition accompanied the name); and the third is not binomial (acceptable names must be proposed in a binomial system of nomenclature, although they may be trinomial). *Any name published in accordance with the International Rules of Zoological Nomenclature is both occupied and available,* whether valid or not.

Of the remaining names, only *Salvadora grahamiae* Baird and Girard 1853 is valid; it was properly proposed and is a synonym of no other name. *Bascanium semilineatum* Cope 1891 is a zoological synonym of *Masticophis bilineatus* Jan 1863, and *Coluber arizonae* Boulenger 1894 is a nomenclatural synonym of *Arizona elegans* Kennicott 1859. *Only an available name whose "title" to a species is clear* (*i.e.* which is neither a synonym nor a homonym of an earlier name) *can be valid.*

It is obvious that, at any one time, there can be only one valid name for a species, although there may be several available names and even more occupied names. Likewise, it is apparent that while all available names are occupied, not all occupied names are available. (HOBART M. SMITH, *Department of Zoology, University of Illinois, Urbana.*)

Recently, Traub and Slattery (*Plant Physiol.*, 1947, **22,** 77–87) observed that the invertase of bottom fermentation yeast differed markedly from that of top yeast in the effectiveness with which it hydrolyzed the levulins in the residue of the 89 per cent ethanol extract of guayule plants, *Parthenium argentatum* A. Gray. It is of interest to compare this observation on the hydrolysis of levulins with reports of earlier work with inulin in which it had been stated that enzymic hydrolysis of inulin [β-D-furanofructosidase activity] was an aspect of the invertase (sucrase or saccharase) of autolyzed yeast (Lindner. *Wschr. Braeu.*, 1900, **17,** 713–716, 762–765; Kuhn. In Hoppe-Seyler's *Z. physiol. Chem.*, 1923, **129,** 59–63; and especially Weidenhagen, as cited by Bamann and Myrbraeck in *Die Methoden der Fermentforschung*, 1940, p. 1900). Weidenhagen identified inulase as β-h-fructosidase, although he found that his preparation hydrolyzed sucrose 5,000 times as actively as it did inulin.

The data presented by Traub and Slattery show that under the experimental conditions top invertase hydrolyzed from 30 to 65 per cent more of the levulins present than were similarly hydrolyzed by bottom invertase. The ratio of the two kinds of activity in invertase preparations from top fermentation yeast differed from the analogous

ratio from bottom yeast by that amount. Hence, it is probable that each preparation is a mixture of enzymes among which are a sucrase and a β-D-furanofructosidase, but not in the same proportion. It is, of course, by no means certain that "invertases" of top and bottom fermentation yeast from any other source would have the same composition or activity as that used here. Plant physiologists were warned as early as the first quarter of the present century that commercial invertase preparations may split other polysaccharides (*i.e.* melibiose) than sucrose and raffinose (Hudson, and Hudson and Harding. *J. Amer. chem. Soc.*, 1914, **36**, 1570; 1915, **37**, 2193–2198). Thus, after treatment with commercial invertase, unless the other possibilities are disposed of, a reducing power may be found and reported as sucrose or raffinose, when actually the sugar reported may not be present at all (cf. McRary and Slattery. *J. biol. Chem.*, 1945, **157**, 161–167). That this effect is due to the presence of more than one enzyme is indicated by the present work and by that of Zechmeister, Tóth, Fuerth, and Bársony (*Enzymologia*, 1941, **9**, 155), Adams, Richtmeyer, and Hudson (*J. Amer. chem. Soc.*, 1943, **65**, 1369–1380), and Pigman (*J. Res. nat. Bur. Stand.*, 1943, **30**, 159–175).

The top and bottom invertases used in the experiments were purchased from the Wallerstein Laboratories, 180 Madison Avenue, New York 16, New York. (HAMILTON P. TRAUB, E. L. GREEN, and M. C. SLATTERY, *Bureau of Plant Industry, Soils, and Agricultural Engineering, U. S. Department of Agriculture.*)

Schizophrenia strikes 1 or 2 per cent of the population of the United States, mostly those between 15 and 35 years of age. (An exact figure of the incidence of schizophrenia in the general population has not been obtained. Kallman uses .85 per cent. But, as he states that 20 institutions in the state of New York in 1945 had 72,252 patients, of which 47,929 were schizophrenics and 12,316 new admissions, and as a report by Pollock, Malzberg, and Fuller (*Hereditary and environmental factors in the causation of manic-depressive psychoses and dementia praecox.* Utica, N.Y.: State Hospital Press, 1939) indicates that some 4.5 per cent of the population will be hospitalized some time in their lives because of mental disease, it seems not unreasonable to suppose that the incidence of schizophrenia in the general population may reach 2 per cent.) A large proportion of these 1,400,000 to 2,800,000 unfortunate people require care in public institutions for the remainder of their lives. What causes all this misery? Does it arise from external causes or from within?

A great deal of light is thrown on these questions by two studies which are not likely to come to the attention of *Science* readers by reason of their places of publication. These studies were made by Franz J. Kallman, using the "Twin Family Method." The first of these is a book of nearly 300 pages (*The genetics of schizophrenia.* New York: J. J. Augustin, 1938). That it has not received the attention it deserves may be due to the large amount of pertinent accessory material, which tends, nevertheless, to discourage perusal. The second is of recent publication (*Amer. J. Psychiat.*, 1946, **103**, 309).

Both studies have been made with meticulous care. The first is on 1,087 schizophrenics and their relatives, covering in all 13,851 persons. The second is based on 174 pairs of monozygotic (one-egg) twins and 517 pairs of dizygotic twins and 4,394 other relatives. The material is, therefore, statistically reliable. Together they present a thoroughly comprehensive picture of the role of heredity in the etiology of schizophrenia, by showing that the incidence of schizophrenia among relatives of schizophrenics increases directly as the degree of biological relationship increases. Thus, the incidence of schizophrenia among step-sibs—which usually are not biologically related to the schizophrenic—is 1.8 per cent; in half-sibs, 7.0 per cent; in full sibs, 14.3 per cent; and in dizygotic twins, 14.7 per cent. (The incidence of schizophrenia in the co-twins of dizygotic pairs of the same sex is 17.4 per cent for males and 17.6 per cent for females, as against 10.3 per cent for twins of opposite sex. This may perhaps be referred to differences in environment associated with sex.) In monozygotic twins it rises to 85.8 per cent.

In examining these statistics, it is to be understood that the question answered is: Given a schizophrenic, how many schizophrenics are found among relatives of a given degree of biological relationship? Thus, in the case of twins, there being only one relative of the degree named, the question becomes: What proportion of the co-twins develop schizophrenia? The contrast in the incidence of schizophrenia in the co-twins of schizophrenic monozygotic twins and those of schizophrenic dizygotic twins is plain evidence of the predominating part played by inheritance in the etiology of schizophrenia. This contrast can arise only because both twins of a monozygotic pair are guided in their development by identical sets of genes, while the genes of dizygotic twins differ in exactly the same way that the genes of ordinary sibs differ.

The failure of a small proportion of the co-twins of the monozygotic twins to develop schizophrenia indicates that, under favorable circumstances (environment), a person with the inheritance for schizophrenia may not reach the clinical or hospitalization stage. Nevertheless, with a single exception, all co-twins in Kallman's series of monozygotics showed evidence of their schizophrenic constitution by those personality characteristics which are called schizoid by psychiatrists. All in all, then, it appears that schizophrenia develops only in persons of a certain genetic constitution. (H. D. GOODALE, *257 West Main Street, Williamstown, Massachusetts.*)

In connection with the 4th Microbiological Congress being held in Copenhagen this month, Michael Heidelberger, president, American Association of Immunologists, has forwarded to *Science* a letter written by Ludwik Hirszfeld of Wroclaw to Thorvald Madsen of Copenhagen. According to the letter, during the German occupation 2,000 Polish scientists and physicians were murdered, many of them having died as a result of experimental operations; two of the leading bacteriologists, Prof. Fleck and Privatdozent Mayzel, "were obliged to work in the laboratory of concentration camps"; and Polish universities were closed for the duration of the occupation, most of the books and apparatus having been removed to Germany with the assistance of German professors. Prof. Hirzfeld, who himself survived the occupation by hiding under a foreign name, concludes: "And so we hope that the Danish scientists will understand that we have no right and no intention to forget and that we don't wish to meet those whom we consider as actively or passively responsible for these crimes."